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ECONOMIC SCIENCES

CONSIDERATIONS OF THE EFFECT OF ARMED CONFLICTS ON ACCOUNTING ESTIMATE OF FIXED ASSETS

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Abstract
Armed aggression in Ukraine emphasized on reconsidering the accounting assumptions and approaches toward recognition, classification and measurement of the fixed assets that suffered physical damage or destruction as well as undergone deuteriation in usefulness due to worsening external environment. In the article the author studies the specifics of accounting estimate of enterprise's fixed assets in terms of uncertainty driven by the armed conflicts. The number of accounting implications with regard to fixed assets accounting and measurement were considered in particular derecognition of fixed assets as a result of damage or destruction, revaluation or testing fixed assets for impairment, accounting for repair of partially damaged assets, etc. The author also provided a comparative analysis of cost and revaluation models applied for accounting of the fixed assets. Additionally, the author proposed methodological approaches for accounting estimate of the fixed assets in wartime depending on such factors as the condition of the assets, level of damage suffered, ability to exercise control over the fixed asset, feasibility to conduct repair of the damaged assets etc.

Keywords: cost model, revaluation model, impairment, revaluation, loss of control, going concern, fixed assets

Being the element of the accounting method a valuation results in providing a quantities estimate of the worth (value) to assets, liabilities, financial flows (revenues, expenses) of the enterprise in monetary terms [1, 2]. The consequences of armed aggression of Russian Federation in Ukraine unleashed on February 24, 2022, actualize exploration of accounting implications, inter alia pose the issue of reliable and unbiased estimate of enterprise's assets. In turn fixed assets occupies a major position of total assets of the enterprise being a mean that over a long term ensure the transformation of input resources (raw materials, energy, labor, services) into finished goods or services that embody economic benefits. Therefore, the aim of this article is to explore the specifics of accounting estimate of enterprise's fixed assets in terms of uncertainty driven by the armed conflicts.

Armed aggression resulted in a set of negative consequences for the physical condition, value and expectation of further use of fixed assets of domestic enterprises. The exact figures are unclear yet, but according to the analysis of Kyiv School on Economics the total amount of actual losses to Ukrainian enterprises might reach a level of USD 13 bn as of the beginning of 2023 [3]. In the economic context the accounting estimate of fixed assets suffered from the effect of the armed aggression in the following ways:

- negative changes in external economic environment worsened expectation of market participants of the use of the assets in the future periods (e.g., increase idle time, decrease in residual useful life's);
- loss of control, joint control or ability to exercise significant influence over the assets as a result of occupation of the territories;
- assets undergone physical destruction or damage due to conduct of ground military operations, bombing, shelling, etc.

The literature review of recent studies indicated an importance of implication of the war on the accounting of enterprise's fixed assets. Exploring the issue of fixed assets accounting in wartime conditions, V. Zhuk, Y. Bezdushna and E. Popko came to the conclusion that in order to respond to the war circumstances in the context of property management, Ukrainian enterprises need to make changes to the accounting policies regarding fixed assets depreciation [4]. When studying the consequences of armed aggression and the occupation of territories, on the accounting estimate of fixed assets, D. Hrycyshen and others concluded that valuation of fixed for accounting purposes should consider the following: (1) difficulties for reconciling the consequences of armed aggression with specific assets, (2) unsettled issues regarding identification and recognition of the consequences of armed aggression in accounting at the level of accounting legislation, (3) difficulties of documenting the consequences of armed aggression due to the absence or limited access to the fixed assets [5]. The author has concluded that the impact of mentioned factors has the of accounting implication to the value of fixed assets in financial statements:

- review of the assumptions on accounting policies related to fixed assets measurement (e.g., method of depreciation, useful lives, the amount of liquidation value);
- review of the assumptions regarding the recognitions of fixed assets (e.g., review the ability to exercise control, joint control or significant influence over the assets);

- review of basic accounting concept for valuing fixed assets (e.g., whether the enterprise complies with going concern, so that the asset might be accounted in accordance with this assumption);
- recognition of losses as a result of damages or destruction of fixed assets;
- decrease in the books value of fixed assets as a result of revaluations or impairments depending on the method for accounting of fixed assets (cost or revaluation model).

When studying the accounting valuation of fixed assets, it is important to consider the methodological aspects in more detail. The description of the approach toward accounting of fixed assets in the context of initial recognition, calculation of historical cost, the choice of an accounting model and the definition of an accounting estimate as of the end of reporting period is stipulated in IAS 16 "Fixed Assets" [6]. In accordance with mentioned methodological standard, the basis for the initial recognition of the value of fixed assets is the sum of historical costs for their acquisition, transportation and bringing to a state suitable for operation. Simultaneously, at initial recognition, the object of fixed assets must meet critarias of controllability, possibility of quantitive valuation and presence of economic benefits from future use. In other words, at the moment of initial recognition the cost approach mentioned in the International Valuation Standards serves as the basis for determining the cost of fixed assets [7].

As the usefulness of fixed assets is realized during the long term the accounting model for reflecting changes in the value of asset over time should be in place (the cost model or the revaluation model). In general, the value of assets can be considered, firstly, from the standpoint of the cost of the resources needed to create or acquire the asset (labor theory of value), secondly, from the standpoint of the value of cash flows and other economic benefits that the asset is expected to generate in the future (neoclassical economic theory). The cost model is based on the principles of the first approach (the cost of the resources needed to create the asset), while as the revaluation model – on the second approach (the amount of economic benefits from the use of the asset). The results on comparative analysis of the two models in mentioned in the table 1. Thus, the accounting valuation of fixed assets can be viewed as a historical original cost in the past, net book or fair value in the present, and liquidation value in the future.

According to the cost model at the end of each reporting period the enterprise's management must assess whether there are critarias of impairment. If such indications exist, it is necessary to estimate recoverable amount for such assets. In case of armed aggression there are several critarias of a decrease in the usefulness of the fixed assets (e.g., negative change in the market and economic environment, increase in market interest rates, physical damage of the asset). Therefore, it is likely that the recoverable amount of the asset will have to be estimated. The letter asset is the higher of two values: fair value lees costs of disposal and value in use. If case the recoverable amount is less than the net book value of the fixed asset, the difference is recognized as an impairment in the income statement.

The similar situation is with the model of revaluation of fixed assets. The negative changes in external environment should most likely cause the need for revaluation of fixed assets (even for the assets that were not physically damaged due to the armed aggression). The revaluation results (change in the fair value of fixed assets) is reflected by an increase / decrease in the net book value of the fixed assets, changes in revaluation reserve, and if the amount revaluation reserve is insufficient to cover decrease in value, the difference is recognized in the income statement.

Table 1

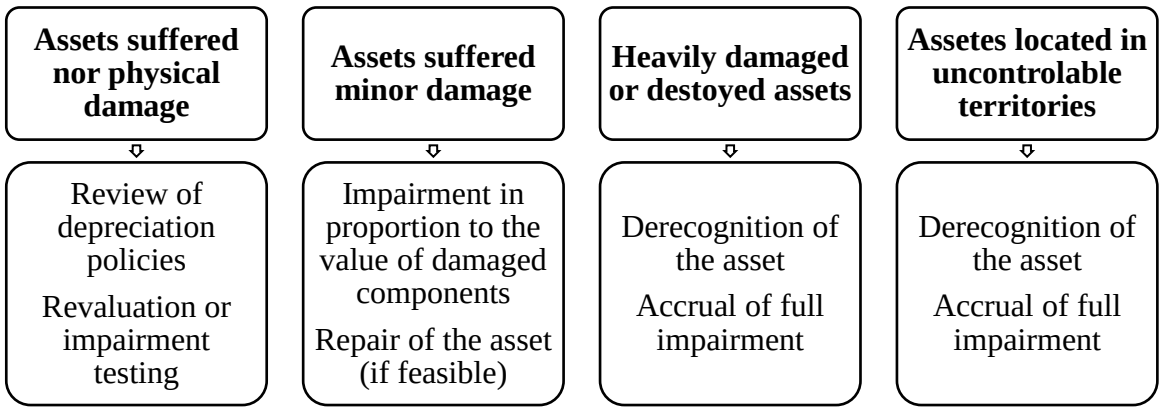
Comparative analysis of the models for accounting of enterprise's fixed assets

Features	Cost model	Revaluation model
Underlying principle of the model	Accounting of the assets at the lower of historical depreciated cost (net book value) or recoverable amount (the higher of fair value less costs of disposal and value in use).	Accounting of the asset at fair value or at an amount close to the fair value. In case of the presence of the active market the fair value should correspond to fair market value.
Responsibility of conducting revaluation as of the reporting date	In case of presence of impairment triggering events, the company's management build the model for testing the assets of cash generating unit for impairment. It is also possible to contract advisor for preparation of the impairment model.	To conduct fixed asset revaluation company's management must contract independent external valuer possessing relevant industry experience and professional qualifications,
Cases for conducting impairment or revaluation	Impairment testing of fixed assets in conducted in case of presence of certain triggering events (e.g., deterioration or physical damage to the asset, fall in market demand, inflationary environment, rise in interest rates).	The revaluation is carried out at the discretion of the management, so that of net book value of fixed assets does not differ significantly from the fair value as of the reporting date.
Comparative indicator for book value	The recoverable amount is used for comparison with the latest net book value (historical depreciated cost). The recoverable amount which is the higher of fair value less costs of disposal and value in use. Impairment analysis is conducted be cash generating units.	Revaluation results is compared with the latest net book value (previous revaluation adjusted for the depreciation expense).
Accounting for change in historical cost	The historical cost is constant, instead the amount of accumulated depreciation is adjusted to account for impairment.	The historical cost is adjusted to account for revaluation results.
Accounting for change in net book value	The book value can be increased to the value that was before the impairment of assets (reversal of impairment).	On the revaluation date, the net book value approximates the fair market value.

Sources: prepared by the author based on the analysis of [6], [8], [9].

During the armed aggression, it is not uncommon to experience physical destruction or damage to assets such as fixed assets, inventories, investment properties, etc. Accordingly, such assets do not meet the critarias for definition of an asset due to the absence of future economic benefits and subsequently should not be reflected in the financial statements. If the assets are partially damaged, it is necessary to consider conduct identification procedures to assess the technical feasibility and economical relevance of the repair of damages assets as well as consider the impairment of such damaged assets accordingly (refer to pic. 1). In case of damaged assets repair the author has concluded that the following steps should be considered:

- recognition of expenses in income statement for the amount of depreciated value of damaged components of the asset (partial impairment of the asset). If it is impossible to derive the value of damaged components the value of damages assets might be decreased proportionally to the level of damage determined based of their technical observation of the damaged asset;
- accounting of the cost of new components as well as other expenses (payroll, services) required to conduct asset repair to return it to previous working condition. The enterprise should choose whether to capitalize such expenses or expense in the current period. The author has concluded that the choice largely depends on the level of damage caused to the asset and the specifics of repair (e.g., replacing the full component of the asset or conducting of maintenance repair);
- accounting for materials obtained during liquidation of the consequences of asset damage (if any).



Pic. 1. Approaches for accounting estimate of the fixed assets in wartime

Sources: prepared by the author based on the analysis of [10], [11]

Regarding fixed assets located in uncontrolled (occupied) territories the author concluded that two options might be generally accepted: either to completely remove these assets from the accounts (e.g., if there is information that such assets were destroyed or significantly damaged) or to impair such assets in full due to loss of control over the assets, and subsequently inability of use of such assets and reap economic benefits. The author believes that if there is no reliable information about the damage or destruction of fixed assets located on uncontrolled territories the second option with accrual of impairment is more justified, since we there is ability to reverse the impairment after regaining the control over the assets.

References

1. Malyuga, N. M. (1999). Valuation in accounting: theory, practice, prospects (on the example of enterprises of the Zhytomyr region). (PhD thesis, Zhytomyr Institute of Engineering and Technology, Zhytomyr, Ukraine).

2. Lovinska, L. G. (2007). Valuation in the modern accounting system of Ukraine's enterprises. (PhD thesis, Kyiv National Economic University named after Vadym Hetman, Kyiv, Ukraine).

3. Kyiv School of Economics (2023). Damages caused to Ukrainian business as a result of Russian aggression are estimated at $13 billion. Retrieved from https://kse.ua/ua/about-the-school/news/zbitki-zavdani-ukrayinskomu-biznesu-vnaslidok-rosiyskoyi-agresiyi-otsinyuyutsya-v-13-mlrd/.

4. Zhuk, V., Bezdushna, Yu., Popko, E. (2022). Depreciation of enterprise's assets in the wartime. Accounting and Finance, No. 1(95), 5-12. doi: https://doi.org/10.33146/2307-9878-2022-1(95)-5-12.

5. Hrycyshen, D. O., Bevzenko, S. G., Gorai, O. S. (2018). Accounting assessment of the consequences of hostilities and occupation of state territories. Bulletin of Zhytomyr Polytechnic State University: Economics, management and administration, No. 1(83), 27-doi: https://doi.org/10.26642/jen-2018-1(83)-27-39.

6. IFRS Foundations (May 2020). International Accounting Standard 16 – Property, Plant, and Equipment. Retrieved from https://www.ifrs.org/content/dam/ifrs/publications/pdf-standards/english/2022/issued/part-a/ias-16-property-plant-and-equipment.pdf?bypass=on.

7. IVSC. 2021. International Valuation Standards (Effective 31 January 2022). London, UK, URL: https://viewpoint.pwc.com/dt/gx/en/ivsc/international_valuat/assets/IVS-effective-31-Jan-2022.pdf.

8. Deloitte. (n.d.). IFRS 13 — Fair Value Measurement. Retrieved from https://www.iasplus.com/en/standards/ifrs/ifrs13.

9. Deloitte. (n.d.). IAS 36 — Impairment of Assets. Retrieved form https://www.iasplus.com/en/standards/ias/ias36.

10. Deloitte. (2022). IFRS in Focus — Financial reporting considerations related to the russia-Ukraine War. Retrieved from https://www.iasplus.com/en/publications/global/ifrs-in-focus/2022/reporting-russia-ukraine.

11. KPMG. (2022). Hot Topic: russia-Ukraine war Accounting and financial reporting impacts. Retrieved from https://frv.kpmg.us/reference-library/2022/russia-ukraine-war.html.

MEDICAL SCIENCES

VIRTUAL REALITY- A POSSIBLE FACTOR IN THE TREATMENT OF CHRONIC PAIN

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UTILIZAREA FENOMENULUI REALITĂȚII VIRTUALE – CA UN POSIBIL FACTOR ÎN TRATAMENTUL DURERII CRONICE

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Abstract
The phenomenon of virtual reality has been proven to be beneficial in various areas of healthcare. It has been established that virtual reality can be effective as a complementary adjunct or non-pharmacologic alternative analgesic in a range of procedures that induce pain and in managing chronic pain [1]. As chronic pain can be an extremely disabling condition that degrades quality of life, this chronicity can lead to somatic misperception, a mismatch between the perception of one's own body and the actual physical state. Since the assessment of the nature of pain can only be appreciated by the patient, disruption of the body image may be associated with an incorrect evaluation of pain, which will induce incorrect treatment and possible adverse reactions [2].

Abstract
Fenomenul realității virtuale a fost dovedit de a fi benefic în diferite domenii ale îngrijirii sănătății. Sa stabilit că realitatea virtuală poate fi eficientă ca adjuvant complementar sau analgezic alternativ non-farmacologic într-o serie de proceduri care induc durerea și în gestionarea durerii cronice [1]. Întru cât durerea cronică poate fi o afecțiune extrem de invalidantă care degradează calitatea vieții, această cronicitate poate duce la percepție somatică greșită, adică nepotrivire între percepția propriului corp și starea fizică reală. Deoarece evaluarea caracterului durerii poate fi apreciată doar de către pacient, perturbarea imaginii corporale poate fi asociată cu o evaluare incorectă a durerii ce va induce un tratament incorect și posibile reacții adverse [2].

Keywords: virtual reality, chronic pain, non-pharmacologic, treatment of pain.
Cuvinte cheie: realitate virtuală, durere cronică, non-farmacologic, tratamentul durerii.

Introducere

Durerea cronică este o problemă majoră, ea fiind prezentă în multe patologii și orice încercare de a o ameliora sau tentativă de a interveni medicamentos deseori apare și cu reacții adverse. Preparatele farmacologice utilizate, ca de exemplu cele din grupul opioidelor pot provoca tulburări digestive, dependență fizică și toleranță [22]. Numărul pacienților cu durere cronică este în creștere din cauza cancerelor, patologiilor autoimune, nevralgiilor, migrenelor. Utilizarea realității virtuale pentru controlul durerii este argumentată de distracția cognitivă ce se bazează pe resurse cognitive concurente, precum atenția pentru a scădea percepția durerii [4]. Există o limită a resurselor atenționale conștiente pe care oamenii le utilizează pentru tot volumul de informații pe care îl primește. Prin reeducarea comportamentului pacienților acționăm și asupra percepției durerii. Unele studii remarcă o scădere a activității cerebrale legate de durere cu jumătate din intensitate, în mai multe zone ale creierului [16].

Durerea cronică este o afecțiune extrem de invalidantă care degradează calitatea vieții, cronicitatea durerii poate duce la o dispercepție somatică. Nu toți pacienții sunt responsivi la terapia medicamentoasă,

astfel apare un interes mai sporit pentru tratamentele alternative [4].

Ce este realitatea virtuală?

Termenul de realitate virtuală a fost folosit pentru prima dată de Jaron Lanier, care a început proiectul de cercetare VPL la sfârșitul anilor 1980. Este descris ca o interfață om-calculator care simulează un mediu real capabil să interacționeze într-o lume virtuală 3D ce mediază realitatea [14]. Realitatea virtuală este definită prin trei caracteristici, imersiune, interacțiune și imaginație [4].

Imersia este definită ca prezență, capacitatea unui sistem de a afișa un mediu generat artificial într-un mod aproape asemănător cu cel real. Aceasta reprezintă o proprietate obiectivă a sistemului, fiind datorat stimulării simțurilor umane (auditive, vizuale, miros, haptic) inclusiv răspunsul la o acțiune perceptivă. Interacțiunea cu un sistem implică trimiterea de mesaje către acesta folosind trei dimensiuni (3D), cum ar fi printr-un dispozitiv montat pe cap sau o minge spațială. Caracteristic pentru interacțiune sunt participarea umană, reacția în timp real și eficiența. Imaginația este văzută ca gândul proiectantului de sistem de a îndeplini un anumit scop [7]. Imaginația poate fi inspirată când hapticul oferă mai multe indicii utilizatorului pentru a construi mental o lume virtuală imaginară dincolo de limitele timpului și spațiului.

Ținta realității virtuale este de a face utilizatorul să creadă că este prezent în mediul generat de calculator [18]. Acesta oferă posibilitatea utilizatorului de a acționa, de a interacționa și de a modifica ambientul virtual în care se află imersat prin simțuri. Persoana nu rămâne pasivă în fața imaginilor și elementelor senzoriale prezentate, există un efect reciproc, utilizatorul poate influența mediul, la rândul său, mediul poate fi influențat de utilizator, acesta poate obține informații prin intermediul interacțiunii [18].

Terapia durerii prin VR a fost experimentată prima dată când Hoffman și colegii au creat „Lumea de zăpadă”, un joc de aruncare cu bulgări de zăpadă asupra personajelor animate [8]. În centrul terapiei de distragere a atenției se află [11] teoria neuromatricei a durerii, care postulează că intrări precum cogniția, senzația și afectul pot schimba producerea durerii. Mecanismele prin care operează distragerea VR explicate de teoria neuromatricei se caracterizează prin faptul că VR prevede un model de activitate generat de neuronii utilizatorului poate fi manipulat prin intrări senzitive, cognitive și afective și poate modifica percepția durerii și acțiuni [1]. În cogniție, resursele atenționale sunt limitate iar distracția senzorială determină mai puține resurse pentru procesarea durerii. Astfel, se crede că introducerea diverselor modalități senzoriale oferă mai puține oportunități subiectului de a aprecia durerea [25]. Durerea poate fi modificată și prin afect. Schimbarea atenției de la circumstanțele neplăcute către stimuli plăcuți, poate evita efectele negative precum anxietatea și stresul [24]. Alte mecanisme pentru analgezia VR includ dezvoltarea abilităților și schimbarea focalizării [10].

Tipuri de sisteme ale realității virtuale

Tipurile de sisteme ale realității virtuale sunt clasificate în funcție de diversitatea utilizării a ofertei tehnologice. În funcție de nivelul de imersiune pe care îl creează aceste pot fi clasificate de la realitate virtuală non-imersivă, realitatea virtuală complet imersivă și pînă la semi-imersivă (realitatea augumentată) [3].

Sistemul VR non-imersiv așa zis desktop (fără dispozitive de intrare) este cel mai puțin costisitor și cel mai puțin imersiv dintre sistemele VR, deoarece necesită cele mai puțin sofisticate componente. Utilizatorii interacționează cu un mediu 3D printr-un monitor de afișare stereo, ochelari și alte componente. Aceste pot fi utilizate în domeniul de modelare [5]. Deși aceste sisteme oferă un nivel mai scăzut de prezență și interacțiune, ele pot atinge niveluri satisfăcătoare de confort, calitate grafică și comoditate pentru utilizator [9]. Exemple de sisteme VR de birou sunt jocurile video, acestea se bazează pe ecranul ce conține doar afișarea 3D fără nici o interacțiune. Legătura dintre acesta și lumea reală constă în integrarea obiectelor grafice computerizate într-o scenă din lumea reală, dar fără a interacționa cu obiectele de pe ecran [3].

O altă formă de sistem VR non-imersiv este lumea virtuală. Acesta cel mai des este utilizat pentru a dezvolta la utilizator capacitatea de observare și de învățare a informațiilor. Prin intermediul mai multor avatare oferă și o conexiune între oameni [3].

Sistemul VR semi-imersiv, numit și sisteme hibride [10], sau sisteme de realitate augumentată, oferă un nivel ridicat de imersiune, păstrînd totodată și simplitatea monitorului sau utilizarea a careva modele fizice. Un exemplu fiind aplicațiile în simulatoarele de conducere [6]. În semi-imersiv, mediul virtual afișat este configurat pe mediul real recunoscut. Pentru construirea unui astfel de sistem, trebuie să corespundă cerințelor de afișare, senzori de urmărire și interfețele cu utilizatorul. Sistemul dat constă din atributele VR și ale lumii reale prin înglobarea obiectelor virtuale în scena realității. Datele în acest tip de sistem sunt introduse și controlate de către utilizatori, cu ajutorul mouse-ului, tastaturii, ochelari și joystick [3].

Sistemul de realitate virtuală imersiv este cel mai costisitor și oferă cea mai mare profunzime de imersiune, fiind compus din HMD, mănuși, etc. Un exemplu de aplicație al acestui sistem este trecerea virtuală a clădirilor [9]. Acest tip de sistem înglobează percepția vizuală și audio a utilizatorului în lumea virtuală și elimină toate informațiile exterioare, încît experiența să fie complet imersivă [3].

Mecanismele realității virtuale

Proprietatea corporală este abilitatea de a construi o reprezentare stabilă a propriului corp în spațiu. În mediul virtual simțul acestor limite poate întra în conflict cu conținutul simulărilor vizuale. Astfel apare necesitatea de a crea avatare maxim identice cu reprezentarea omului în realitate, chiar și cu posibilitatea ca acestea să fie personalizate individual [21]. Un mecanism bine studiat este distragerea atenției, este cunoscut din terapia durerii cronice. Distracția ca o distanță față de propria realitate creată de imersiune. Hoffman a reușit să arate că calitatea imersivă are un efect semnificativ de modulare pozitivă a durerii [17]. Teoria distragerii atenției poate explica dece anterior aplicarea acesteia a scăzut nivel de durere

la utilizarea VR în cadrul durerii acute. VR necesită echipamente speciale care să fie active pentru a oferi o ușurare, pare a fi complicat, costisitor și nerealist pentru tratare într-o clinică sau spital obișnuit [4]. Noi mecanisme pentru impactul VR precum sunt modificările neurofiziologice, adaptarea modificată ar putea oferi beneficii nu doar în cadrul durerii acute. Procesul de distragere poate implica competiția pentru atenție într-o senzație excesivă precum este durerea și concentrarea orientată conștient asupra altei activități de procesare a informațiilor. Rețeaua neuronală care este responsabilă de elaborările de intrări dureroase, nu este doar nocioceptivă, aceasta poate fi provocată de stimuli tactili, auditivi și vizuali [31]. De aici vine ideea că este o rețea multisenzorială și devine candidat pentru modularea transmodală a durerii [23].

Un alt mecanism important este cel de modificare a comportamentului, de asemenea având efect analgezic și fiind util în durerea cronică. Keefe a arătat efectele benefice ale integrării VR în comportament cu diferite intervenții cum ar fi hipnoza, meditația, terapia de expunere [19]. Efectul analgezic prin hipnoză ar putea duce la scăderea necesității de administrare a preparatelor opioide. Dar dincolo de sustragerea atenției cunoscută de mulți apar și mecanisme de nedistragere prin care VR poate reduce durerea [30]. Studiile care sunt direcționate spre aceste mecanisme sunt mai mult țintite pe durerea cronică decât pe cea acută. În studiile respective se folosesc programe VR diferite decât în cele cu distragerea atenției [12].

Utilizarea realității virtuale în tratamentul durerii acute și cronice

Durerea acută este definită ca durere care durează pînă la 6 luni iar cea cronică peste 6 luni și persistă dincolo de vindecarea cauzei sale intuite. Complexitatea acestei afecțiuni implică dimensiuni psihologice, neurobiologice și sociale pentru care defapt nu există un tratament universal [26]. Analgezicele farmacologice pot avea efecte secundare grave, inclusiv dependență iar utilizarea greșită a analgezicelor opioide este o problemă în creștere rapidă în rîndul anumitor categorii de pacienți [29]. Deși, se pare că durerea acută ar putea fi mai ușor gestionată de către pacient cu doze mai mici și perioade mai scurte de tratament, cea cronică vine cu un set de suferințe psihice și emoționale din cauza neputinței sau limitării în activități sau toleranță la medicamente. "Teoria controlului porții " a atenției este modelul cel mai larg acceptat în explicarea impactului VR asupra durerii [27]. Teoria porții atenției postulează că realitatea virtuală reduce percepția durerii prin absorbția și deturnarea atenției de la durere. Semnalele durerii nu sunt pur și simplu transmise de la periferie la creier dar sunt modelate pe parcurs. Se știe că durerea cronică este substanțial diferită de cea acută [15]. În durerea acută sunt implicate regiunile cerebrale precum: cortexul somatosenzorial primar și secundar, cortexul cingulat, amigdala, substanța cenușie periapeductală, nucleul accumbens, insula anterioară, insula posterioară și talamusul. În timp ce durerea cronică afectează cortexul prefrontal medial, care este mai bine adaptat la durere și conectivitatea în căile implicate în modularea durerii este redusă [32].

În condiții normale durerea este detectată de nocioceptori care sunt localizați în tot organismul. Nocioceptorii răspund la stimuli care pot indica leziuni tisulare și transmit aceste informații sistemului nervos central prin două tipuri de neuroni, fibre A-delta și fibre C. Fibrele A-delta sunt mielinizate și au viteze de conducere de la 3 pînă la 30 m pe secundă, transmit semnalele de durere care sunt percepute ca ascuțite sau arzătoare relativ de scurtă durată. Fibrele C sunt nemielinizate și trimit semnalele la viteza de conducere de 0,5-2 m pe secundă, care sunt responsabile pentru durerea surdă și face parte din mai multe afecțiuni cu durere cronică, precum și pentru durerea secundară asociată cu durerea acută [13]. Se consideră că fibrele C au evoluat ca un mijloc de a proteja organismul [33].

Analgezia sau așa numita atenuare a durerii în timpul stării de conștientă poate fi efectuată prin întreruperea mijloacelor normale ale organismului de a detecta durerea. Medicamentele blochează producția de prostaglandine, care activează fibrele C. Este puțin probabil ca realitatea virtuală să acționeze asupra durerii prin efecte directe asupra fibrelor C. Însă realitatea virtuală poate influența direct și indirect percepția și semnalizarea durerii prin emoție, concentrare, atenție, memorie și alte simțuri cum ar fi tactil, auditiv, vizual. De asemenea, realitatea virtuală poate schimba activitatea sistemului complex de modulare a durerii corpului, astfel modificând percepția durerii. Melzack și Wall au propus teoria controlului porții de durere, ce susțin că diverse activități ale sistemului nervos central îndeosebi atenția, memoria, emoția pot juca un rol important în percepția senzorială. Teoria dată afirmă că semnalele durerii nu sunt pur și simplu transmise de la periferie către creier, ci mai degrabă „porțile nervoase" determină gradul în care senzația de durere întră în conștientizarea unui individ [27].

Pornind de la ipotezele propuse în teoria controlului porților de durere Mayer și colab. au demonstrat existența unui sistem complex descendent de control al durerii ce își are originea din creier. Activarea chimică sau electrică a acestui sistem prin intermediul fibrelor ce coboară din zona cenușie periapeductală (PAG) a mezencefalului a produs o analgezie pronunțată prin inhibarea semnalelor de durere la nivelul coloanei vertebrale [20]. Deoarece substanța cenușie primește impulsuri de la diferite zone ale creierului, am putea afirma că modularea sistemului nocioceptiv afectează profund emoțiile și atenția percepției durerii. Pe lângă inhibarea transmiterii semnalelor de durere sistemul descendent, poate facilita și transmiterea durerii [28].

Concluzii

Fenomenul realității virtuale reprezintă o metodă alternativă de tratament al durerii cronice prin distragerea atenției. Realitatea virtuală este o tehnologie de viitor cu ajutorul căreia putem modifica percepția durerii la nivel neuronal. În dependență de tipul de realitate virtuală: non-imersiv, semi-imersiv, imersiv putem influența asupra gradului de prezență în lumea virtuală și feedback-ul oferit de sistem în urma distracției oferite. Realitatea virtuală imersivă reprezintă cea mai complexă metodă pentru distragerea

atenției, utilizatorii au parte de efecte auditive, tactile, haptice, vizuale și pot gestiona jocul prin ajutorul unui avatar care îi ghidează anumite activități.

References

1. Ahmadpour N., Randall H.,et al. Virtual Reality interventions for acute and chronic pain management. In: Int J Biochem Cell Biol. 2019 114:105568. doi: 10.1016/j.biocel.2019.105568.

2. Alemanno F., Houdayer E., Emedoli D., Locatelli M., Mortini P., Mandelli C., Raggi A., Iannaccone S. Efficacy of virtual reality to reduce chronic low back pain: Proof-of-concept of a non-pharmacological approach on pain, quality of life, neuropsychological and functional outcome. În: PLoS One. 2019 nr. 14 (5), pp. 1-15. ISBN1932-6203. doi: 10.1371/journal.pone.0216858.

3. Alqahtani A.S., Daghestani L.F., et al. "Environments and System Types of Virtual Reality Technology in STEM: a Survey" International Journal of Advanced Computer Science and Applications 8(6), 2017.
http://dx.doi.org/10.14569/IJACSA.2017.080610

4. Bamodu O., Ye X. M. Virtual Reality and Virtual Reality System Components. AMR 2013 pp. 765–767:1169–72.
https://doi.org/10.4028/www.scientific.net/amr.765-767.1169.

5. Bell J. T. și Fogler H.S., "The investigation and application of VR as an educational tool,"1995 In: Proceedings of the American Society for Engineering Education,

6. Blackedge J.M, Barrett M. și Coyle E., Using Virtual Reality to Enhance Electrical Safety and Design in the Built Environment, Paper 17, 2010. http://arrow.dit.ie/engscheleart2/17

7. Carvalho M. R., Freire R.C., Nardi A.E. Virtual reality as a mechanism for exposure therapy. In: World J Biol Psychiatry. 2010 nr. 11(2 Pt 2) pp.220-230. doi: 10.3109/15622970802575985.

8. Colloca L., Raghuraman N., et al. Virtual reality: physiological and behavioral mechanisms to increase individual pain tolerance limits. In: Pain. 2020 nr. 161(9) pp. 2010-2021. doi: 10.1097/j.pain.0000000000001900

9. Cox C. "The use of computer graphics and VR for visual impact assessments," 2003.

10. Dani T. H., și Rajit G., Virtual Reality - A New Technology for the Mechanical Engineer In: Mechanical Engineers' Handbook, a 2-a ed., 1998, pp. 319-327.

11. Faria, V., Borsook, D. Placebos and Nocebos in Migraine: Children and Adolescents. In: Headache. 2019 https://doi.org/10.1007/978-3-030-02976-0_8

12. Garrett B. M., Tao G., et al. Patients perceptions of virtual reality therapy in the management of chronic cancer pain. In: Heliyon. 2020 nr. 12;6(5):e03916. doi: 10.1016/j.heliyon.2020.e03916.

13. Gold J. I., Belmont K. A., Thomas D. A. The neurobiology of virtual reality pain attenuation. In: Cyberpsychol Behav. 2007 nr. 10(4) pp. 536-544. doi: 10.1089/cpb.2007.9993.

14. Gorman P.J., Meier A.H., Krummel T., Simulation And Virtual Reality In Surgical Education, 1999 În: Arch Surg/Vol 134.

15. Grichnik K. P., Ferrante F. M. The Difference Between Acute and Chronic Pain. In: Mt. Sinai J Med. 1991 nr. 58(3) pp. 217–220.

16. Hoffman H. G., Boe D. et al. Virtual reality hand therapy: A new tool for nonopioid analgesia for acute procedural pain, hand rehabilitation, and VR embodiment therapy for phantom limb pain. In: J Hand Ther. 2020 nr. 33(2) pp. 254-262. doi: 10.1016/j.jht.2020.04.001.

17. Hoffman H. G., Seibel E. J., Richards T. L. Virtual reality helmet display quality influences the magnitude of virtual reality analgesia. In: J Pain 2006; nr. 7: pp. 843–850. doi:10.1016/j.jpain.2006.04.006

18. Isdale J., What Is Virtual Reality? A Web-Based Introduction, Version 4, http://VR.isdale.com/WhatIsVR/frames/WhatIsVR4.1.html

19. Keefe F. J., et al.Virtual reality for persistent pain: a new direction for behavioral pain management. In: Pain 2012; nr. 153: pp. 2163–2166. doi:10.1016/j.pain.2012.05.030

20. Kim J. S., Cho S. H., et al. Flexible artificial synesthesia electronics with sound-synchronized electroluminescence In: Nano Energy, 2019, vol.59, pp. 773-783 doi.org/10.1016/j.nanoen.2019.03.006

21. Lindner S., Latoschik ME., Rittner H., Use of Virtual Reality as a Component of Acute and Chronic Pain Treatment In: Anästhesiol Intensivmed Notfallmed Schmerzther 2020; nr. 55(09) pp.549-561 doi: 10.1055/a-1022-3038

22. Le May S., Tsimicalis A., Noel M., et al. Immersive virtual reality vs. non-immersive distraction for pain management of children during bone pins and sutures removal: A randomized clinical trial protocol. In:J Adv Nurs. 2021 nr. 77(1) pp. 439-447. doi: 10.1111/jan.14607.

23. Longo M., Iannetti G., et al. "Linking pain and the body: neural correlates of visually induced analgesia," In:The Journal of Neuroscience,2012 vol. 32, nr. 8,pp. 2601–2607.

24. Mallari B., Spaeth E. K et al. Virtual reality as an analgesic for acute and chronic pain in adults: a systematic review and meta-analysis. In: J Pain Res. 2019 nr. 12 pp.2053-2085. doi: 10.2147/JPR.S200498.

25. Malloy K. M., Milling L. S. The effectiveness of virtual reality distraction for pain reduction: a systematic review. In: Clin Psychol Rev. 2010 nr. 8 pp. 1011-1018. doi: 10.1016/j.cpr.2010.07.001.

26. Noel, M., Rabbitts, J. A., et al. The influence of pain memories on children's and adolescents' post-surgical pain experience: A longitudinal dyadic analysis. In: Health Psychology: Official Journal of the Division of Health Psychology, American Psychological Association, 2017 36(10), 987–995. https://doi. org/10.1037/hea0000530

27. Jones T., Moore T., Choo J. The Impact of Virtual Reality on Chronic Pain. In: PLoS One. 2016 nr.11(12):e0167523. doi: 10.1371/journal.pone.0167523.

28. Porreca, F., Ossipov, M. H., şi Gebhart, G. F. Chronic pain and medullary descending facilitation. In: Trends in Neurosciences 2002, nr.25 pp. 319–325.

29. Reibel D. K., Greeson J. M., et al. Mindfulness-based stress reduction and health-related quality of life in a heterogeneous patient population. In: Gen. Hosp. Psychiatry, 2001, nr. 23 pp. 183–192.

30. Shiri S., Feintuch U., et al. A virtual reality system combined with biofeedback for treating pediatric chronic headache--a pilot study. In: Pain Med. 2013 nr. 14(5) pp.621-627. doi: 10.1111/pme.12083.

31. Tommaso M., Ricci K., et al. Virtual visual effect of hospital waiting room on pain modulation in healthy subjects and patients with chronic migraine. In: Pain Res Treat. 2013 515730. doi: 10.1155/2013/515730.

32. Vekhter D., Robbins M. S., et al. Efficacy and Feasibility of Behavioral Treatments for Migraine, Headache, and Pain in the Acute Care Setting. In: Curr Pain Headache Rep. 2020 nr. 26;24(10) pp. 66. doi: 10.1007/s11916-020-00899-z.

33. Watkins L.R., şi Maier S.F. The pain of being sick: implications of immune-to-brain communication for understanding pain. In: Annual Review of Psychology 2000, nr. 51 pp.29–57

TREATMENT OPTIONS IN HYPERPLASTIC GINGIVITIS: OZONE THERAPY UPDATES

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Abstract

The approach towards hyperplastic gingivitis (HG) treatment is related to the identification of the main etiological factor and the action on the site of gingival proliferation. The existing treatment modalities (conservative, surgical, physiotherapy) are not fairly efficient, recurrences often occur and existing anti-inflammatory drugs act superficially and have a temporary impact on gingiva. They are in fact limited to the elimination of the inflammatory process in the gum and the sclerosis of the hypertrophic sectors with different medication remedies (superficial and deep sclerosis) selected depending on the clinical type of hypertrophic gingivitis. A clinico-analytical, descriptive and cohort study of HG cases was realized, with a narrative review of the contemporary references concerning the subject under discussion.The researches were performed in a group of 27 patients divided into two cohorts: the control cohort 15 patients (9 females and 6 males) and the study cohort 12 patients (7 females and 5 males). The study was axed on patients included in both cohorts, diagnosed with HG using the parameters recommended by the American Academy of Periodontology (2009), aged between 17 and 68 years, with considerable increase in gingival volume up to I-III degree, false gingival pockets, glossy purplish color, bleeding on probing, supra- and subgingival dental deposits.The inclusion criteria in both cohorts enrolled patients diagnosed with HG with a lack of previous treatment for at least 3 months. The protocol for examination and treatment of patients with HG included the registration of laser Doppler flowmetry (LDF) before treatment, after treatment, then at 1 month, 3 months, 6 months, 12 months post-treatment. Subsequently, the scaling, professional brushing, air flow and sanation of the oral cavity were performed. The average value of the blood perfusion status in the gingival tissue in the patients from the study cohort with HG evaluated based on the level of microcirculation (M) represents: until treatment 13.07; after treatment 10.71; at 1 month of treatment 11.77; at 3 months of treatment 12.27; at 6 months of treatment 12.74 and 12 months after treatment 13.26. The average value of the microcirculation efficiency index (MEI) before treatment 1.14; after treatment 1.43; at 1 month of treatment 1.46; at 3 months of treatment 1.14; at 6 months of treatment 1.21 and 12 months after treatment 1.69. Submucosal injection of medical ozone into hypertrophied papillae with a concentration of 8–10 mg/mL has been shown to be sufficient and effective in treatment. The result of the evaluation of the average value of the level of capillary blood microcirculation (M) in the hypertrophied tissue in the control cohort determined until treatment 14.60; after treatment 9.75; at 1 month of treatment 10.34; at 3 months of treatment 8.41; at 6 months of treatment 8.19 and 12 months after treatment 15.05. The result of the evaluation of the average value of the capillary blood MEI in the hypertrophied tissue in the control cohort appreciated up to treatment 0.96; after treatment 0.94; at 1 month of treatment 1.44; at 3 months of treatment 0.90; at 6 months of treatment 1.05 and 12 months after treatment 0.91. The evaluation of capillary blood microcirculation indices (M, IEM) in hypertrophied gingival tissue revealed a consioderable improvement, that indicated a high respeonse to the administered treatment. The average values of the microcirculation level (M) and of the MEI in the study cohort increased after the treatment within one month, 3, 6 and 12 months.

Keywords: hypertrophic gingivitis, microcirculation index, gingival inflammation, blood perfusion status, treatment, ozone therapy, laser Doppler flowmetry, microcirculation efficiency index.

Background: Hyperplastic gingivitis (HG) is a chronic inflammatory process, mainly located in the gingiva with the predominance of the proliferation of fibrous elements of the chorion, cellular elements and basement membrane of the gingival epithelium. Despite the diversity of etiological factors and pathogenetic mechanisms of gingival hypertrophy, the local changes emerge mainly due to the disturbance of regulation of tissue growth and the development of hyperpasia of tissue components of the gum [10]. This condition is ensured by the unfavorable action of local and general factors, may appear as a separate nosologic entity or show a symptom of other conditions and occurs without destroying the integrity of the dentogingival junction. There is usually a direct dependence between the nature of the process in the gums and the cause of its development. HG treatment with existing traditional methods is long and difficult, post–treatment recurrences and complications often occur.

Objectives of the study: Estimation and assessment of the efficiency of the ozone administration in HG treatment with Laser Doppler flowmetry (LDF) method.

Materials and methods: A clinico-analytical, descriptive and cohort study of HG cases was performed, with a narrative review of the contemporary references related to the subject under discussion. The researches were performed in a group of 27 patients divided into two cohorts: the control group 15 patients (9 females and 6 males) and the study cohort 12 patients (7 females and 5 males). The study focused on patients included in both cohorts, diagnosed with HG using the parameters

proposed by the American Academy of Periodontology (2009), aged between 17 and 68 years, with considerable increases in gingival volume grade I–III, gingival pockets (false), glossy purplish color, bleeding on probing, supra– and subgingival dental deposits.The inclusion criteria in both groups represent patients diagnosed with HG with a lack of previous treatment of at least 3 months. The exclusion criteria were patients with hyperthyroidism, leukemia, cancer and diabetes. In the investigated cohorts, the efficiency of the administered treatment methods was comparatively evaluated: the control group (classic non–surgical conservative method in 13 patients and the classic surgical method in 2 patients) and the study group (non–surgical ozone therapy method in 12 patients). The protocol for examination and treatment of patients with HG included the registration of LDF before treatment, after treatment, then at 1 month, 3 months, 6 months, 12 months post–treatment. Subsequently, the scaling, professional brushing, air flow and sanation of the oral cavity were performed. Submucosal injections with O2–O3 8–10 mg / mL were performed every 3–4 days (from 5–10 procedures, depending on the severity of the process and recovery), intravenous perfusion or injection with O3 in 0.09% NaCl sol., nr.10 –14, 2 times a week (depending on the severity of the process and recovery). Patients in the control cohort also underwent scaling, professional brushing, superficial sclerosis of the hypertrophied gingival by instillations and swabs with cauterizing remedies and gingivectomy. Periodontal tissue probing was performed using the LAKK–02 laser–Doppler analyzer. An infrared laser provides complete information about blood flow in 1–1.5 mm of tissue. Previously, blood pressure was measured with a tonometer and pulse with a pulse oximeter. The principle of operation of the LDF method is based on the Doppler effect, where the ray of light directed towards the tissue is dispersed on its static and dynamic components [2]. Computerized analysis of LDF–graphs was per formed using the program that analyzed and calculated the parameters of blood microcirculation M, σ, Kv, ALF, ACF, AHF, IEM. Where M — the microcirculation index, σ — the standard deviation of the oscillation amplitude of the blood flow, Kv — the coefficient of variation, ALF — the maximum amplitude of the oscillations of the blood flow in the low frequency band, the maximum of the high frequency oscillations of the blood flow , MEI — microcirculation efficiency index. In order to obtain stable data in the evaluation of the capillary blood microcirculation, the impression of the jaw in occlusion was obtained, then in 3 points to be examined: left, center and right, a guide tube made of copper for the Laser Doppler probe was introduced. The same procedure was repeated on the jaw. The narrative review of the references was performed under the form of a synthesis in the Discussion section of the article. In order to achieve the study objectives, the scientific publications were searched over the GoogleSearch, PubMed, Medscape, NCIB, Hinari database. More than 50 bibliographic sources were analyzed. Twelve relevant and significant primary sources were identified and selected according to the impact score and big data, with a scientific and reproducible approach to the subject under discussion.

Results and discussions: HG is characterized by a chronic evolution. In the absence of timely administered treatment HG may lead to the serious consequences, with the formation of a wide focus of infection, mobility and tooth loss, attenuation of the body's reactivity. According to Чумакова Ю. Г. (2019), HG constitutes 24.8% of the structure of gingivitis, in pregnant women it occurs with a frequency from 8 to 24%. At the same time, the highest rate of HG disease (20.7%) is registered in the group of youngest women 18–20 years old, who usually have their first pregnancy. It is also attested in young people in the period of sexual maturity around 3–5% [7], the localized form of gingival hypertrophy represents 3–11% of all diseases of the periodontium and is mainly determined in the region of the incisors and canines of the lower and upper jaw [5]. Gingival hypertrophies are increases in the volume of the gums, of different causes. They are relatively common and produce functional and aesthetic changes [6,11,12]. The volume and color are different depending on the histological structure, most often they are bleeding, soft, inflammatory or firm and fibrous. To assess the clinical aspects of gingivitis, it is necessary to monitor the following changes in volume, shape, size, color, consistency, texture, position of the gum and blood microcirculation, ease and severity of bleeding, increased production of gingival fluid, gingival itch, pain and gingival tenderness. [3,4]. Gingival bleeding is one of the early signs of gingival inflammation and even precedes the color changes of the gingiva, being the main objective clinical sign due to microulcerations in the gingival epithelium and the fragility of capillaries in the chorion [1]. Determining the degree of bleeding may be the method of evaluating regeneration processes, but limitations are described in the use of this method as a clinical parameter [5,8,10]. In order to prevent posttreatment recurrences and complications, as well as to prolong the period of HG remission, ozone therapy has been proposed, a current and modern method widely used in the practice of various medical fields. Changes in blood flow and assessment of treatment effectiveness were monitored using pre– and post–treatment LDF at 1, 3, 6, 12 months.

In our analitical studies the average value of the blood perfusion status in the gingival tissue in the patients from the study cohort with HG evaluation based on the level of microcirculation (M) constitutes: 13.07 before treatment and 10.71 after treatment; at 1 month of treatment 11.77; at 3 months of treatment 12.27; at 6 months of treatment 12.74 and 12 months after treatment 13.26. The average value of the MEI before treatment 1.14; after treatment 1.43; at 1 month of treatment 1.46; at 3 months of treatment 1.14; at 6 months of treatment 1.21 and 12 months after treatment 1.69 (Table 1 and 2). Submucosal injection of medical ozone into hypertrophied papillae with a concentration of 8–10 mg/mL has been shown to be sufficient and effective in treatment. The result of the evaluation of the average value of the level of capillary blood microcirculation (M) in the hypertrophied tissue in the control group determined until treatment 14.60; after treatment 9.75; at

1 month of treatment 10.34; at 3 months of treatment 8.41; at 6 months of treatment 8.19 and 12 months after treatment 15.05. The result of the evaluation of the average value of the capillary blood MEI in the hypertrophied tissue in the control group appreciated up to treatment 0.96; after treatment 0.94; at 1 month of treatment 1.44; at 3 months of treatment 0.90; at 6 months of treatment 1.05 and 12 months after treatment 0.91.

Table 1.

The result of the evaluation of the average value of the capillary blood microcirculation efficiency index (MEI) in the gingival tissue in the study cohort before treatment and within 1, 3, 6, 12 months after the treatment

Patients indicators	MEI pre	MEI post	MEI 1 month	MEI 3 months	MEI 6 months	MEI 12 months
1	0.69	0.74	0.86	0.92	1.02	1.25
2	1.00	0.95	1.14	1.23	1.34	1.40
3	0.59	0.56	0.67	0.85	0.99	1.03
4	1.07	0.77	1.34	1.41	1.53	1.56
5	0.83	0.75	0.97	1.11	1.22	1.29
6	0.94	1.56	2.00	1.21	2.02	2.05
7	1.57	0.64	1.59	1.10	1.63	1.71
8	0.96	1.41	0.91	0.91	1.57	1.64
9	1.44	0.79	0.89	1.13	1.67	1.77
10	0.9	1.79	1.33	0.85	1.43	1.51
11	1.05	1.11	2.09	1.69	1.78	1.93
12	1.14	1.43	1.46	1.14	1.47	1.66
Median value, MEI	1.015	1.041667	1.270833	1.129167	1.4725	1.566667
Standard error	0.080298	0.117897	0.130885	0.070662	0.086674	0.084273
P	<0.001					

Table 2.

The result of the evaluation of the average value of the level of capillary blood microcirculation (M) in the gingival tissue in the study cohort before treatment and within 1, 3, 6, 12 months after the treatment

Patients indicators	M pre	M post	M 1 month	M 3 months	M 6 months	M 12 months
1	11.50	12.58	10.59	12.41	13.18	11.89
2	7.67	4.36	8.14	9.03	7.09	8.60
3	14.03	7.87	11.30	11.56	13.02	13.89
4	9.36	11.32	10.51	11.33	12.14	10.90
5	10.64	9.03	10.98	11.46	9.84	10.51
6	9.62	9.51	10.34	15.05	14.52	10.62
7	16.35	11.05	8.41	8.19	11.51	14.23
8	14.6	9.75	14.79	12.74	11.02	14.2
9	15.1	10.79	13.86	17.24	16.87	15.73
10	11.92	12.45	6.98	13.26	8.18	11.79
11	10.85	4.53	16.27	7.18	13.74	13.19
12	13.07	10.71	11.77	12.27	12.78	12.61
Median value, M indicator	12.05917	9.495833	11.16167	11.81	11.99083	12.34667
Median error	0.755423	0.783798	0.790944	0.808134	0.782001	0.581239
P	<0.1					

Conclusions:

1. The evaluation of capillary blood microcirculation indices (M, IEM) in hypertrophied gingival tissue revealed a consioderable improvement, which indicated a high respeonse to the administered treatment.

2. The average values of the microcirculation level (M) and of MEI in the study cohoort increased within 1 month, 3 months, 6 months and 12 months after the treatment.

3. Submucosal injection of medical ozone into hypertrophied papillae with a concentration of 8–10 mg/mL may be considered as an effective and sufficient treatment option.

4. No statistically significant positive changes of M and MEI were registered in the control cohort, in which their unstable and minor growth was revealed.

References

1. Dumitriu, H., Dumitriu, S. Parodontologie. Editura Viaţa Medicală Romanească. Bucureşti, 1997, 351 p.

2. Pirgari A. Efectul oxigenului activ in forma sa alotropă in tratamentul complex al parodontitelor marginale. Teza de d.ș.m. Chișinău, 2017.

3. Surin S., Piyawat P., Akira H. Microcirculation of the healthy human gingiva. Odontology. 2002; 90: 48-51.

4. Varunee K., Mullika S., Anongporn S., Julalux K. Blood flow and human periodontal status. Odontology. 2002; 90: 52-56.

5. Barer G.M., Lemetskaya T.I. Periodontal disease. Clinic, diagnosis and treatment. Moscow, VUNMTs, 1996: 39-44.

6. Bezrukova, I.V. The current state of the issue of periodontal dressings. MRJ. 1985; 8: 12.

7. Bezrukov V.M. Handbook of dentistry. Moscow. Medicine. 1998: 118-120.

8. Nikolaev A.I., Tsepov L.M. Practical therapeutic dentistry: textbook guidelines - 4th ed. M., MEDpress-inform, 2005, 548 p.

9. Moles D., McColl E., Tredwin C. et al. Standards in Dentistry. Second Edition. UK, Orchard Press, 2018, 108 p.

10. Tatishvili N.G., Khardzeishvili O.M. Features of the quantitative distribution of lymphocytes and protein in the tissues of the gums in hypertrophic gingivopathy. Tbilisi, Georgia Medical News. 2001; 7-8: 70-71.

11. Tsarinsky, M.M. Therapeutic dentistry: a textbook for students of dental faculties, interns and practitioners. Rostov-on-Don, Phoenix, 2008, 508 p.

12. Hirschfeld J., Higham J., Chatzistavrianou D. e al. Systemic disease or periodontal disease? Distinguishing causes of gingival inflammation: a guide for dental practicioners. British Dental Journal. 2019; 227 (11): 961–966. https://doi.org/10.1038/s41415-019-1050-8

ETIOPATHOGENESIS OF CONGENITAL CLUBFOOT

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Abstract
Congenital clubfoot is one of the most common congenital malformations, affecting 1-3 per 1000 live births and occurring twice as often in male fetuses. Although it is called congenital, it is not an embryonic malformation but is a developmental deformity that occurs in the second trimester of pregnancy.

Keywords: clubfoot, pathogenesis, CTEV

To date, the exact etiology of the malformation is not known and there are several possible etiopathogenic theories:

Mechanical theory (Ombredanne) - is one of the oldest theories developed on the aetiology of clubfoot;

- mechanical factorsincriminated pathogenetically are: feto-maternal dystocia; oligohydramnios; uterine malformations (bicornuate uterus, infantile uterus); twinning; fetal trauma; amniotic flange [1,2].

Vascular theory - decreased blood flow in the anterior tibial artery and its derivatives [1].

Genetic theory - is supported by hereditary transmission demonstrated in 10-15% of cases. So far no karyotypic chromosomal abnormalities have been detected. It is assumed that the malformation results from genetic mutations caused by teratogenic factors.

Developmental arrest theory (Max Böhm) - the foot passes during embryonic development through 4 intermediate stages; in the third month the foot is in equinus → follows a position of abduction and supination → then supination disappears → subsequently returns to the normal position.

Developmental arrest in one of these stages causes congenital clubfoot.

Neuro-motor plate theory (P. Lombard) - considers the clubfoot position to be secondary to an imbalance of postural tone of agonist and antagonist muscles through a defective mechanism of synaptic transmission between the cerebrospinal extrapyramidal system and peripheral motor neurons. Restoration of neuromuscular balance is achieved within 6 to 24 months [1].

Genetic component in the aetiopathogenesis of congenital clubfoot

CTEV is a multifactorial disorder, therefore, the combination of genetic and environmental factors are known contributors to this developmental abnormality. To date, a number of genes involved in limb patterning, such as PITX1, HOXA, HOXD, TBX4 and RBM10, as well as genes involved in muscle contraction, have been identified as possible factors. Of the many environmental factors investigated, maternal smoking appears to hold the strongest consistent association with this disorder [4].

Genes in the Homeobox family

Homeobox genes (HOXA, HOXD) are a family of transcription factors that play a central role in the morphogenesis processes of embryonic development. In particular, this family determines the correct genesis of the axial skeleton and limbs, which is why they have been proposed as candidate genes for CTEV pathogenesis [4, 3].

Caspases pathway genes

Aspartate-dependent cysteine proteases (caspases) are part of a family of cysteine proteases that play a key role in the processes of apoptosis, necrosis and inflammation. This pathway has been investigated because caspase activity appears to be linked to proper limb development [4].

Collagen family genes

Collagen family genes have also been linked to CTEV. Related genetic research has focused on the COL9A1 and COL1A1 genes. COL9A1 codes for one of the three alpha chains of type IX collagen, a component of hyaline cartilage, while COL1A1 codes for the pro-alpha 1 chains of type I collagen, a component of most connective tissue found abundantly in bones and tendons [4].

T-box family

The T-box family comprises transcription factors that play a crucial role in embryogenesis and morphogenesis. Like other genes with a similar role, they are possible genetic inducers of CTEV [4].

PITX1-TBX4 pathway

The TBX4 protein is a transcription factor that is mainly expressed in the hind limb and is thus associated with CTEV pathogenesis. It has been studied in association with another transcription factor, PITX1, which is part of the same pathway. The PITX1-TBX4 pathway is responsible for early limb development. Numerous studies report that mutations in genes encoding the transcription factors PITX1 and TBX4 lead to reduced lower limb musculature and classic clubfoot phenotypes [4].

Environmental causes in utero

Smoking during pregnancy has been associated with congenital malformations, including clubfoot [46]. NAT1 and NAT2 N-acetylation genes modulate biotransformation of exogenous substances such as tobacco smoke, and one study found that there were significantly more NAT2 slow acetylators among cases of clubfoot.

References

1. MUSTARI, M. Nasser, et al. Congenital talipes equinovarus: A literature review. Annals of Medicine and Surgery, 2022, 104394.

2. PAVONE, Vito, et al. The etiology of idiopathic congenital talipes equinovarus: a systematic review. Journal of Orthopaedic Surgery and Research, 2018, 13.1: 1-11. doi.org/10.1186/s13018-018-0913-z.

3. RAINES, Anna M., et al. Key pathways regulated by HoxA9, 10, 11/HoxD9, 10, 11 during limb development. BMC developmental biology, 2015, 15: 1-15. doi.org/10.1186/s12861-015-0078-5.

4. BACINO, Carlos A.; HECHT, Jacqueline T. Etiopathogenesis of equinovarus foot malformations. European journal of medical genetics, 2014, 57.8: 473-479. ISSN 1769 – 7212. doi.org/10.1016/j.ejmg.2014.06.001.

OLIGOHYDRAMNIOS – CAUSES AND EFFECTS ON PERINATAL OUTCOME

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Abstract

Oligohydramnios is a clinical condition manifested by a decrease in the level of amniotic fluid below the norm corresponding to the gestational age or an AFI less than 5 cm. The causes of this disorder include maternal, fetal and placental complications, all of them can lead to poor fetal outcomes. The decrease of the normal amniotic fluid volume, corresponding to the term of gestation, indicates the presence of maternal, fetal or placental conditions. One of the most common fetal causes of oligohydramnios are anomalies of the reno-urinary system, which constitute approximately 20% of all congenital fetal anomalies and occur in 3-4 % of pregnancies. Unilateral or bilateral renal agenesis, renal dysplasia and hypoplasia obstructiv uropathy, polycystic kidney disease – can be related to development of oligohydramnios. Intrauterine fetal growth restriction (IUGR) is another condition associated with an AFI less than 5 cm. IUGR represents a major obstetric problem, being associated with conditions such as prematurity, fetal distress, impairment of neuropsychic development or perinatal death.

Keywords: oligohydramnios, amniotic fluid index (AFI), maximal vertical pocket (MVM), intrauterine growth restriction (IUGR), preterm premature rupture of membranes (PPROM).

Introduction

The total volume of amniotic fluid results from the balance between its production and resorption. Until the 20 week of gestation, the largest amount of amniotic fluid is constituted by fetal lung secretions and maternal plasma. Around the 16 week of gestation fetal kidneys begin to function, so fetal urine makes up most of the amniotic fluid. Thus, various anomalies of the genitourinary system of the fetus, such as obstructive uropathy, renal dysplasia or renal agenesis can cause a low amniotic fluid level[8]. Oligohydramnios is associated with numerous complications in pregnancy, being often an indicator of various fetal, maternal or placental pathologies.

Quantification of amniotic fluid is an important component of the biophysical profile in USG evaluation of perinatal outcome. Transabdominal ultrasound evaluation of amniotic fluid volume includes maximal vertical pocket (MVM) or the amniotic fluid index (AFI), depending on the gestational age. The AFI can be determined aftel 20 weeks of gestation and its normal range is 5 to 25 cm, while normal range for MVM is 2 to 8 cm[2],[7]. Oligohydramnios often increases the risk of fetus distress and accompanies a wide range of reproductive disorders including anomalies of fetus and disorders of mother and placenta.

Aim of study

The aim of study was to analyse the fetal, maternal and placental causes of oligohydramnios and the fetal outcome in pregnant women with low amniotic fluid level at term.

Material and methods

A search in PubMed, Medline, EMBASE, and reference lists was performed. Inclusion criteria for articles selection: singleton pregnancy, definition of olgohydramnios as AFI less than 5cm, AF assessment at 37-42 gestational weeks.

Results

Oligohydramnios is associated with numerous maternal, fetal and placental complications of pregnancy. Maternal causes include chronic hypertension, preeclampsia, vascular diseases, diabetes or the use of certain drugs such as NSAIDs, angiotensin-converting enzyme inhibitors, cytostatics and others[6]. Fetal causes of oligohydramnios include preterm premature rupture of membranes (PPROM) that accounts more than 37% of all pregnancies diagnosed with oligohydramnios. An important fetal complication associated with low amniotic fluid volume are genitourinary tract abnormalities. It includes renal agenesis, renal hypoplasia, obstructive nephropathy. The incidence of such complications is between 5 to 8 per 1000 live births. Intrauterine fetal growth restriction (IUGR) is another condition associated with an AFI less than 5 cm[3]. IUGR represents a major obstetric problem, being associated with conditions such as prematurity, fetal distress, impairment of neuropsychic development or perinatal death. Intrauterine fetal growth restriction leads to severe complications both in short and long term, being associated with serious metabolic, hematological, neurological disorders[1]. Placental causes of oligohydramnios include placental abruption and donor-transfused syndrome in monochorionic twin pregnancies. There are several additional complications to be aware of during the gestation complicated by oligohydramnios. These include an increased risk of cesarean delivery, fetal heart rate decelerations, or umbilical cord compression[4].

Conclusions

In conclusion, oligohydramnios is a serious clinical condition that increases the risk of perinatal complications. It frequently creates premises for the development of intrauterine growth restriction in addition to many pathological conditions, including congenital anomalies of kidney and urinary tract, low birth weight, CMV infection. Therefore, newborns with oligohydramnios demands intensive fetal surveillance and proper antepartum and intrapartum care.

Prognosis and therapeutic behavior depends on the etiology, the gestational age at the time of diagnosis and the degree of oligohydramnios. Diagnosing the condition in the third trimester is most often of idiopathic

origin. Thus, it can be stated that the topicality of the given theme and the necessity of researching the pathology in depth are determined not so much by the prevalence of oligohydramnios, but by the negative consequences it has on the intrauterine development of the fetus, maternal complications and the evolution of the pregnancy.

References

1. https://pubmed.ncbi.nlm.nih.gov/25626056/
2. https://pubmed.ncbi.nlm.nih.gov/28405117/
3. Committee opinion no. 501: Maternal-fetal intervention and fetal care centers. Obstet Gynecol. 2011
4. https://obgyn.onlinelibrary.wiley.com/doi/pdf/10.1002/uog.15929
5. Rabie N, Magann E, Steelman S, Ounpraseuth S. Oligohydramnios in complicated and uncomplicated pregnancy: a systematic review and meta-analysis. Ultrasound Obstet Gynecol. 2017
6. https://www.ncbi.nlm.nih.gov/books/NBK562326/
7. Hughes DS, Magann EF, Whittington JR, Wendel MP, Sandlin AT, Ounpraseuth ST. Accuracy of the Ultrasound Estimate of the Amniotic Fluid Volume (Amniotic Fluid Index and Single Deepest Pocket) to Identify Actual Low, Normal, and High Amniotic Fluid Volumes as Determined by Quantile Regression. J Ultrasound Med. 2020
8. Matharu K, Ozanne SE. The fetal origins of disease and associations with low birthweight. NeoReviews. 2004

LEGG-CALVE-PERTHES DISEASE

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Abstract

Introduction: Despite the fact that the prevalence of aseptic osteonecrosis of the femoral head is 2.9% of all osteo-muscular disorders and 25% of hip joint disorders [1], this problem requires special attention, while late diagnosis and lack of adequate treatment would could lead to the patient's disability. Because of this, Legg-Calve-Perthes disease is a socially significant pathology [3].

Materials and methods: the statistical retrospective research based on the 30 medical files of patients hospitalized and treated between 01.01.2021 and 31.12.2022, in the section of Pediatric Orthopedics and Traumatology, IMSP Mother and Child Institute from Chisinau , with the diagnosis of Legg-Calve-Perthes disease. Were included in the study patients with idiopathic avascular necrosis confirmed by clinical and radiography signs , age ≤ 18 years old .

Results: According to the statistical retrospective research, 30 children included with LCPD at different stages, of which 19 were male and 11 female, with the maximum represented between 6-10 years (15 child). Pacients from the urban environment, presented to the doctor in the first six months after the onset of symptoms , while from the rural in the most cases (12 children) sought medical help more than 6 months. After performing the radiography of the hip joint in each of the children included in the study, it was established that most of hospitalized repeatedly had stage V of the disease (10 children), but primary pacients – stage III (3 patients), in 2 cases primary radiography was without pathological changes, and after performing the MRI, was established stage I of the disease.

Conclusions: Legg-Calve-Perthes disease occurred more frequently in children aged between 6-10 years; with a higher incidence among males (1.7:1) and with the prevalence of patients from rural areas (66.7%). Urban patients, who have better and more diverse access to medical assistance, present to the doctor in the first months of illness. Most often primary patients present with stage III of the disease. The most used treatment method is conservative treatment.

Keywords: Legg-Calve-Perthes disease (LCPD) , idiopathic avascular necrosis, aseptic osteonecrosis of the femoral head , hip joint disorders.

Introduction

Legg-Calve-Perthes disease is a self-limiting pathology, characterized by the interruption of the blood supply to the epiphysis of the femoral head, which can lead to its necrosis. LCPD mainly affects children between 2-14 years. Vascular ischemia is temporary, and complete revascularization of the epiphysis occurs in 2-4 years, if the child's age is under 12 years at the onset of the disease. [1]

Worldwide, the prevalence of Legg-Calve-Perthes disease is different and ranges from 0.2 to 19.1 per 100,000 children. The countries of East Asia and the equatorial region have the lowest morbidity; it was found that the incidence of the disease increases with increasing latitude[1]. Boys get sick 4-5 times more often than girls. Usually, the development of the pathological process occurs unilaterally, and bilateral damage occurs in 10% of cases [3].

Nowadays, the main opinion is that Legg-Calve-Perthes disease is caused by a genetic combination with other internal and external factors, having a multifactorial nature [2]. Regardless of the causes of LCPD, the interruption of blood supply in femural head represents a main pathogenetic moment that leads to all subsequent pathological changes.

The first manifestation of the disease is usually pain in the hip and limping, may also be present: limitation of movements in the affected hip joint, impotence of the function, fatigue of the muscles of the affected limb. But, nevertheless, Legg-Calve-Perthes disease is devoid of pathognomonic symptoms and has a similarity at the onset of the disease with a number of other diseases of the musculoskeletal system in children. [1,2,3]

Radiography remains the traditional method of diagnosing Legg-Calve-Perthes disease, but it is uninformative in the early stages. In these cases, MRI is used.

Aim

Efectuation of the complex study with reference to the prevalence by sex, by the environment of origin, manifestations, clinical and radiological diagnosis , and treatment in Legg-Calve-Perthes disease in children.

Methods

The study included 30 patients hospitalized and treated between 01.01.2021 and 31.12.2022, in the section of Orthopedics and Pediatric Traumatology, IMSP Mother and Child Institute in Chisinau, with the diagnosis of Legg-Calve-Perthes disease. A statistical study was carried out retrospectively based on the medical files of the patients who were included according to the predetermined criteria. The study inclusion criteria were: patients with idiopathic avascular necrosis confirmed by clinical and radiographic signs, age ≤ 18 years.

Descriptive statistical processing of the data obtained from the observation files was performed in Microsoft Office Excel. The confidentiality of personal data was respected .

Results

During the period of researche, among the 30 hospitalized patients, 19 (63.3%) were male, and respectively 11 (36.7%) were female (Figure 1). Thus, we observe that the male gender predominates in a ratio of 1,7:1.

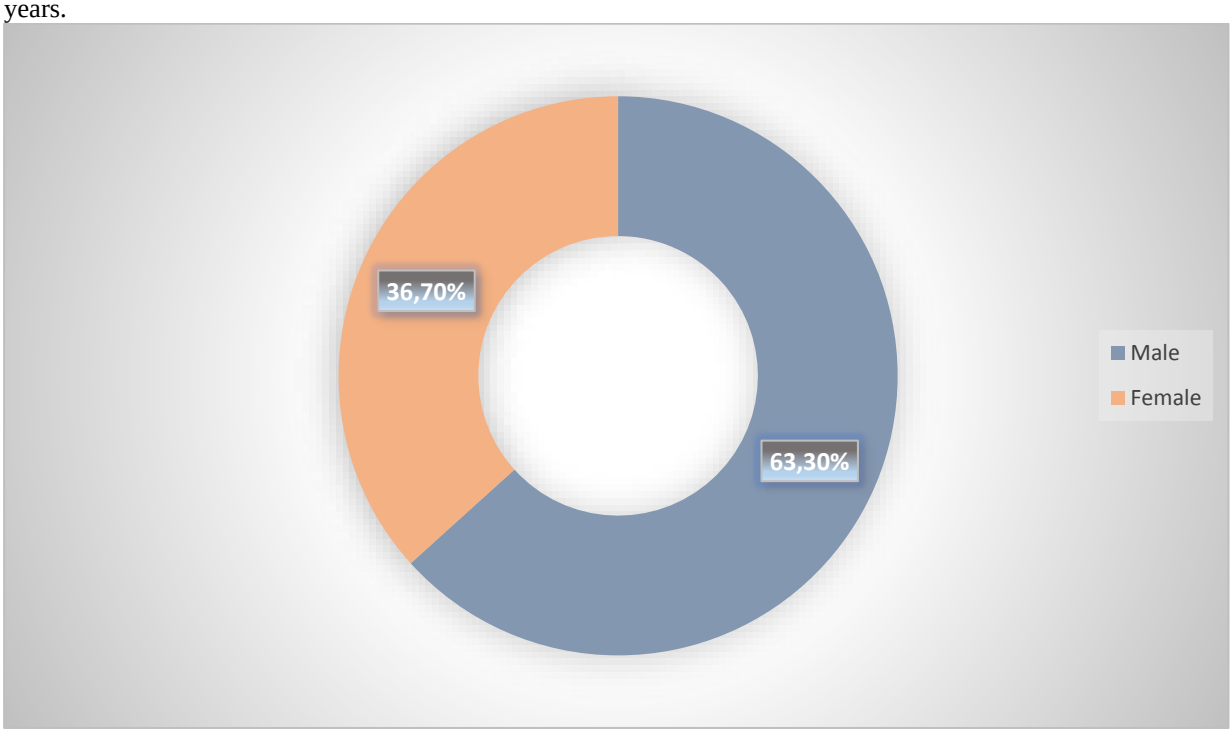

Figure 1. Distribution of patients by sex

Idiopathic aseptic osteonecrosis of the femoral head occurs in children of all ages , but with a higher incidence in children aged between 6-10 years (Figure 2).

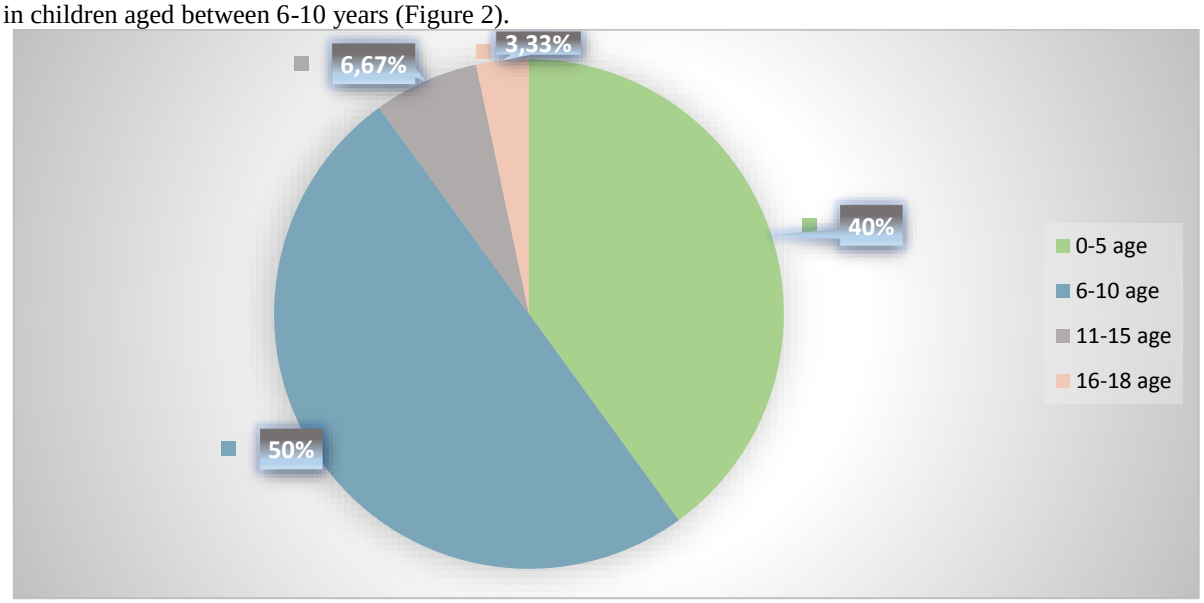

Figure 2. Distribution of cases depending on age groups (%)

During the research of the observation files of the 30 children with Legg-Calve-Perthes disease, it was established that children from the urban environment presented themselves to the hospital faster compared to those from the rural environment, most likely it is a consequence of low accessibility in rural areas to a medical care system. Thus, from the urban environment 5 patients (representing 16.67%) presented during the

first 3 months and 5 patients (16.67%) in an interval between 3 and 6 months, while in the case of the rural environment 12 children (40%) sought medical help more than 6 months after the onset of disease symptoms, 5 children (16.67%) presented between 3 and 6 months and only 3 patients (10%) during the first 3 months. (Figure 3)

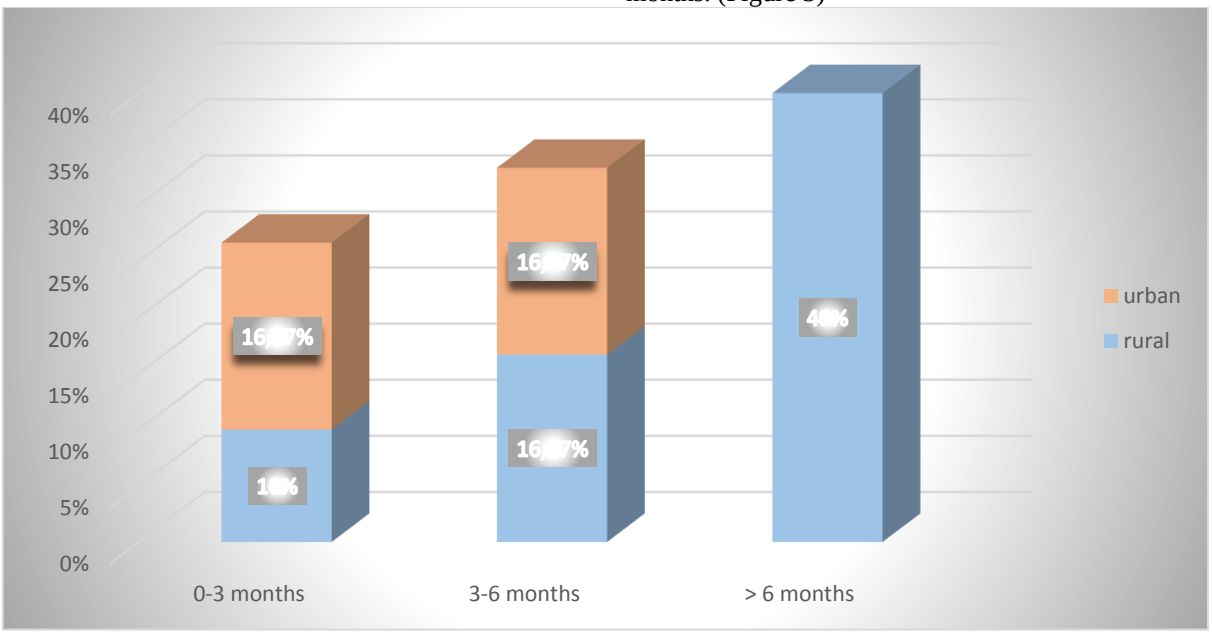

Figure 3. Distribution of patients according to the duration until the presentation to doctor in dependence on the environment of origin.

The clinical picture in the patients in the studied group was dominated by pain in the affected joint in 93.3%, lameness in 80% of patients, limitation of movements in 66.7%, functional impotence in 40%, pain in the knee joint in 26.7% patients and muscle fatigue in the affected limb in 13.3% (Figure 4).

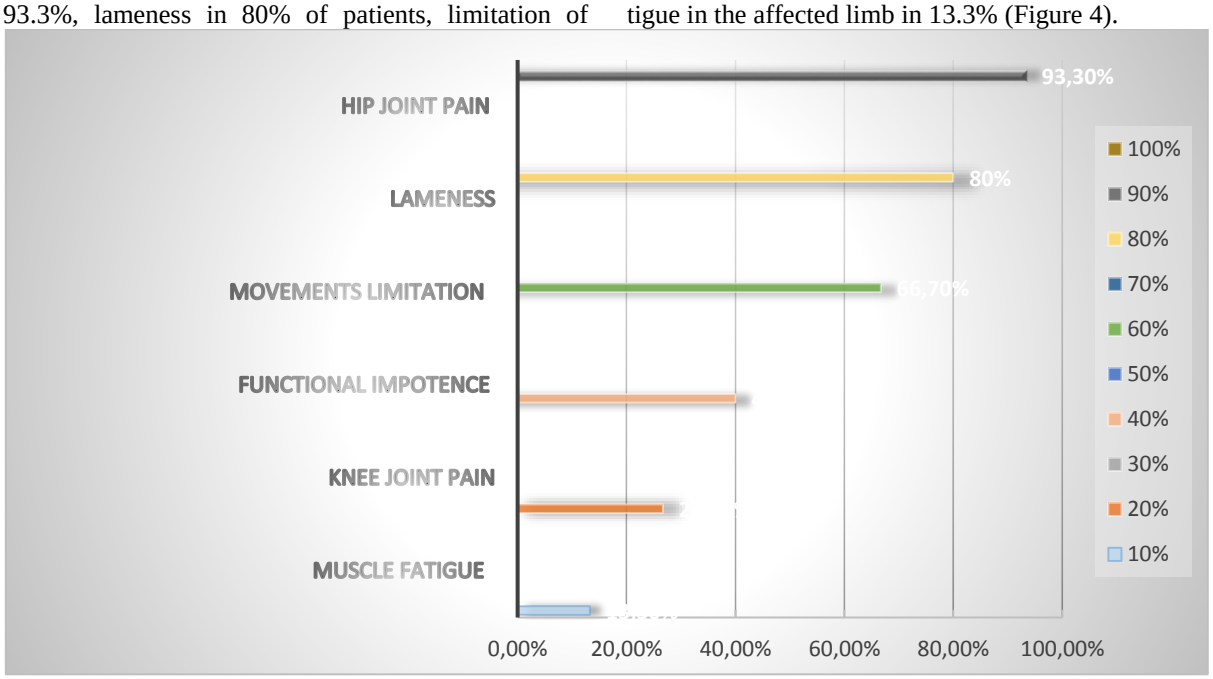

Figure 4. Distribution of the group of patients by symptoms

During the objective examination of the patients in the studied group, limping was detected in 80% of children, muscle hypotrophy of the affected limb and flexion contracture presents in 73.3%, abduction contracture in 70%, pain syndrome present on palpation in 63.3% of cases, rotation contracture in 60% of children, in 53.3% of children was detected the shortness of the affected limb , and in 40% positive Drahman sign . (Figure 5)

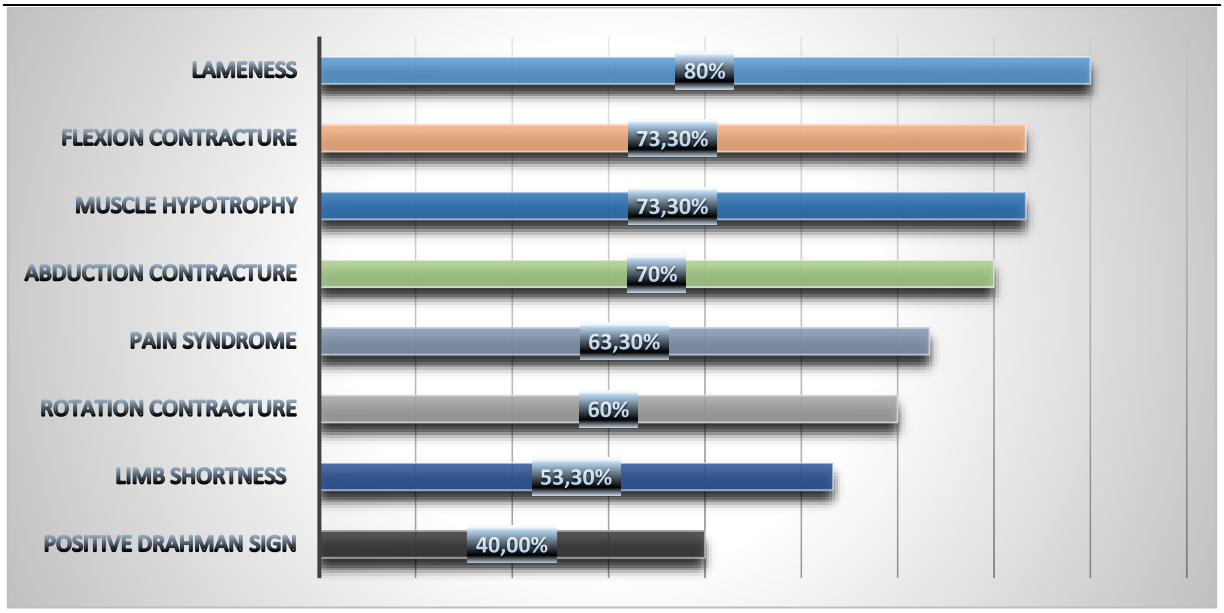

Figure 5. Distribution of the patient group on objective signs

In the research, radiography of the hip joint was performed in each child, after which stage V of the disease was detected in 10 children (33.33%), stage III in 9 children (30%), stage VI in 5 patients (16.67%), stage IV in 4 children (13.33%) and in 2 children , the X-ray was without changes,and after performing the MRI, they were diagnosed with stage I of the disease. (Figure 6)

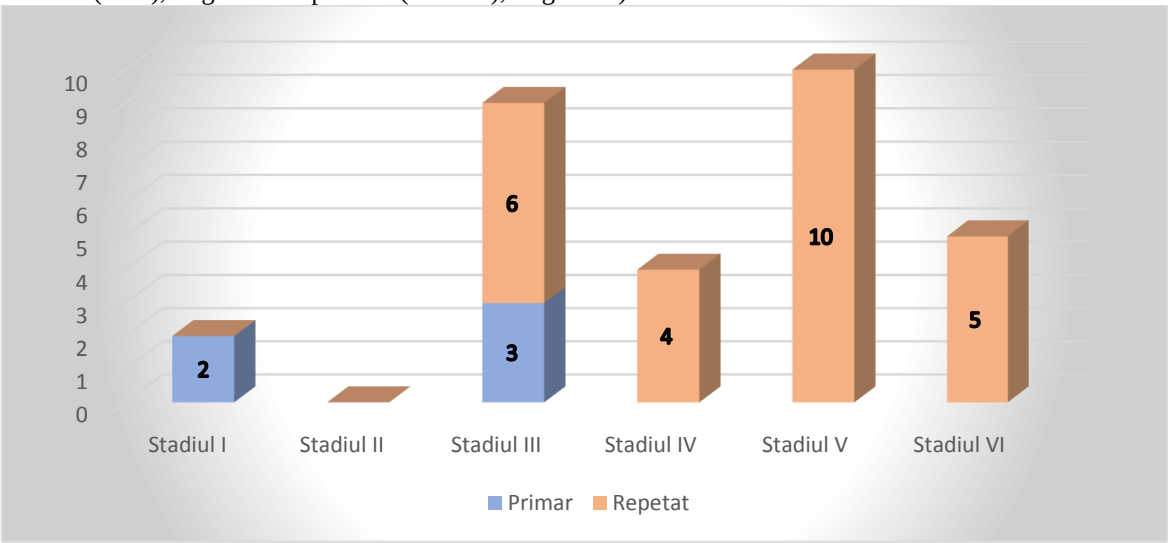

Figure 6. Distribution according to the stage of the disease depending on the number of visit

In the research, conservative treatment was applied to all children diagnosed with Legg-Calve-Perthes disease, and surgical treatment was applied to only 7 of them. (Figure 7)

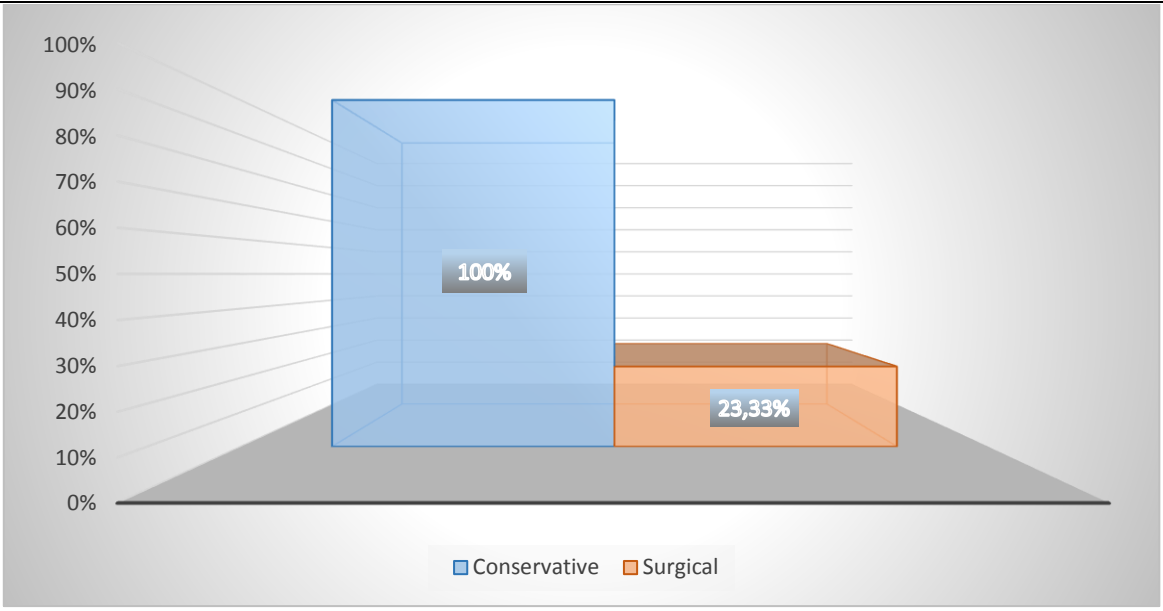

Figure 7. Distribution of the group of patients after the applied treatment

Discussion

Legg-Calve-Perthes disease refers to socially significant diseases, because in the absence of adequate treatment it leads to the development of instability of the hip joint, coxarthrosis and disability, therefore it requires diagnosis and the application of treatment as early as possible.

In the retrospective study, were included 30 patients with aseptic necrosis of the femoral head in different stages, of which 19 were male and 11 female. In the given group of patients, there is a predominance of the male gender. The age of the patients in the research group varied between 0 and 16 years, the period with the maximum occurrence of the disease was represented between 6-10 years.

The children's environment and the length of time until presentation for medical help were two important characteristics analyzed. Thus, it was observed that the patients from the urban environment (10 children), who have better and more diverse access to medical assistance, visited the doctor in the first six months, while the patients from the rural environment (20 children) in the majority cases (12 children) sought medical help more than 6 months after the onset of the disease.

Of the 30 patients included in the study group in the period 2021-2022, after the x-ray of the hip joint was performed on each of them, it was established that most were with stage V of the disease (10 children), of which all were hospitalized repeated and followed systematic conservative treatment, in 9 children, of which 6 children were hospitalized repeatedly and 3 primary, stage III was established, stage VI in 5 patients examined repeatedly after multiple treatments, in 4 children was diagnosed stage IV of Legg-Calve-Perthes disease according to the STEINBERG classification and in 2 children , the radiograph was without pathological changes, and after performing the MRI, was established stage I of the disease .

In the children from the research, the symptoms were practically identical, with minimal variety. Pain in the affected joint was present in 93.3%, lameness in 80% of patients, limitation of movements in 66.7%, functional impotence in 40%, pain in the knee joint of the affected limb in 26.7% patients and muscle fatigue in 13.3%. Thus, the clinical picture is a typical one, but, nevertheless, Legg-Calve-Perthes disease is devoid of pathognomonic symptoms and has a similarity of clinical picture with a number of other musculoskeletal system diseases in children.

During the objective examination of the patients in the studied group, limping was detected in 80% of children, muscle hypotrophy of the affected limb and flexion contracture presents in 73.3%, abduction contracture in 70%, pain syndrome present on palpation in 63.3% of cases, rotation contracture in 60% of children, in 53.3% of children was detected the shortness of the affected limb , and in 40% positive Drahman sign .

Currently, the most used treatment method with good results is conservative treatment, which is aimed at improving the disturbed vascularization of the hip joint, relieving pain, restoring the function of the affected joint and stopping the progression of bone tissue necrosis, and includes bed rest in the first stages, physical therapy, swimming, vitamin therapy. Operative methods are aimed at restoring congruence in the femoral joint and ensuring a complete coverage of the femoral head with the acetabular component, but are used only in severe cases with failure of conservative treatment.

Conclusions

Legg-Calve-Perthes disease occurred more frequently in children aged between 6-10 years; with a higher incidence among males (1.7:1) and with the prevalence of patients from rural areas (66.7%). Urban patients, who have better and more diverse access to medical assistance, present to the doctor in the first months of illness. Most often primary patients present with stage III of the disease. Clinical manifestations in patients with aseptic osteonecrosis of the femoral head are pain in the affected joint, lameness, limitation of movements, functional impotence, pain in the knee

joint and muscle fatigue of the affected limb. But, nevertheless, Legg-Calve-Perthes disease is devoid of pathognomonic symptoms and has a similarity of clinical picture with a number of other musculoskeletal system diseases in children. Imaging diagnosis - radiography of the hip joint, which is carried out in all patients, allows the assessment of the dynamics of the treatment and the determination, as necessary, of the indications for surgical treatment. MRI remains a gold standard for the early stages of the disease. The treatment of LCPD in children aims to prevent juvenile coxarthrosis and is predominantly orthopedic and only in case of decentration of the femoral head and/or the presence of a cyst in the femoral neck is resorted to surgical treatment. Regular recovery treatment is of great importance in achieving good results.

References

1. Lysikov V.A. Surgical treatment of Legg-Calve-Perthes disease. Thesis for the degree of candidate of medical sciences, 2016, pp. 26-58

2. Catteral A. Legg-Calve-Perthes Syndrome. Clin. Orthop.1981;158:p.41-52. PMID: 7023775

3. Indian J Orthop. Management of Perthes' disease 2015 Jan-Feb; 49(1): 10–16. PMID: 25593353, PMCID: PMC4292319 , doi: 10.4103/0019-5413.143906

DIAGNOSIS AND TREATMENT OF AUTOIMMUNE THROMBOCYTOPENIA

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Abstract

A descriptive, retrospective study was carried out in which the clinical manifestations and treatment results were analyzed in 45 patients with the diagnosis of autoimmune idiopathic thrombocytopenia, who were on record in the Hematology Department and the Consultative Center of the Oncology Institute during the years 2017- 2022. The study showed that idiopathic autoimmune thrombocytopenia was determined more frequently in people aged 30-49 years (46.6%) and predominated in women (65%), and the hemorrhagic syndrome was more frequently manifested by petechiae (62.2%), ecchymosis (55.5%), less often - epistaxis (26.66%) and gingivoragia (24.4%). In most cases (71.2%), in the general blood analysis the platelets were solitary, less often the platelets constituted 20-50×109/l (28.8%) and in the bone marrow examination more frequently (51.6%) an increase in megakaryocytes with a decrease in platelets was determined, and in 22.5% of cases with a decrease in platelets, a decrease in megakaryocytes also occurred. It was also determined that treatment efficacy was higher when splenectomy was performed. The 5-year progression-free survival of patients with splenectomy was 91%, as opposed to progression-free survival of 17% for patients treated with glucocorticoids.

Keywords: idiopathic autoimmune thrombocytopenia, hemorrhagic syndrome, treatment.

Introduction

Autoimmune thrombocytopenia or idiopathic thrombocytopenic purpura (ITP) is a pathology that is part of hemorrhagic diatheses, which is acquired as a result of a complex immune process. It is characterized by the reduction of platelets, caused by their increased destruction, and can be asymptomatic or accompanied by manifestations of bleeding in the mucosa and skin of varying severity [6]. ITP can occur in patients of both sexes and all ages. It does not show racial characteristics [2]. According to research conducted in Europe, the incidence of ITP is increasing in elderly patients. The idea is supported by the results of studies carried out in the UK and Denmark, which denote the increase in the incidence of ITP in people aged >60 years [4]. The diagnosis of ITP will be established on the basis of clinical manifestations, the results of the general analysis of peripheral blood, the results of the bone marrow examination and the exclusion of pathologies that can cause secondary autoimmune thrombocytopenia [3]. The treatment of idiopathic autoimmune thrombocytopenia is aimed at combating antibodies with an increase in the number of platelets. Several treatment strategies are known. Initially, they opt for non-invasive methods such as corticosteroids, intravenous immunoglobulins, monoclonal antibodies, thrombopoietin receptor antagonists. In the absence of effectiveness of conservative treatment, splenectomy is chosen [5].

Aim of the study

Study of the clinical hematological aspects and the results of the treatment of idiopathic autoimmune thrombocytopenia.

Materials and methods

A descriptive, retrospective study was carried out in which the clinical manifestations and treatment results were analyzed in 45 patients with the diagnosis of autoimmune idiopathic thrombocytopenia, who were on record in the Hematology Department and the Consultative Center of the Oncology Institute during the years 2017- 2022. Patients were selected for the sample based on inclusion and exclusion criteria. Inclusion criteria: patients with a confirmed diagnosis of ITP; age > 18 years; the possibility of monitoring patients. Exclusion criteria: age < 18 years; positive HBV, HCV markers; positive HIV test; pathology confirming secondary ITP; lack of possibility of monitoring.

The diagnosis was established on the basis of the clinical and paraclinical examination (general blood analysis, bone marrow examination). Age characteristics, clinical manifestations, hematological changes and treatment results were analyzed.

The treatment response was assessed based on the following classification: complete response – if the number of platelets increased $>100\times10^9$/l; with response - in cases when the platelet count is 30-100×10^9/l or at least double the primary platelet count; no response – in cases when the number of platelets does not exceed 30×10^9/l or is lower than twice the value of the number of platelets [1].

Rezults

The distribution of patients according to the age at which the diagnosis was established showed that idiopathic autoimmune thrombocytopenia developed more frequently in people aged 30-49 years (44.6%) followed by the 18-29 age group and 50-70 years (28.8% and 26.6%, respectively) (table 1) .

Table 1.

Distribution of patients with idiopathic autoimmune thrombocytopenia depending on age

Age	The number of patients	Frequency (%)
18-29	13	28,8
30-49	20	44,6
50-70	12	26,6
Total	45	100

The distribution of patients according to age and sex demonstrated that idiopathic autoimmune thrombocytopenia in all age groups was more often determined in women than in men (figure 1). The ratio of approximately 3:1 was established. Especially, the increase in the rate of idiopathic autoimmune thrombocytopenia was observed in women in the age group of 50-70 years in which 11 of 12 patients were identified - women (91.7%) and only one man (8.3%).

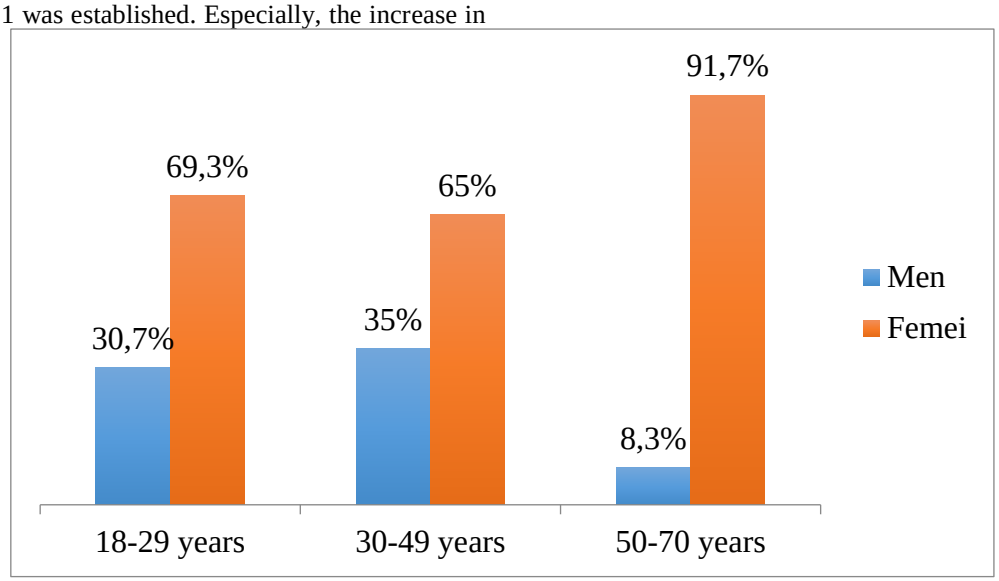

Figure 1. Distribution of patients with idiopathic autoimmune thrombocytopenia according to age and sex

The analysis of patients' complaints revealed that the most common clinical manifestations were petechiae (62.2%), ecchymosis (55.5%), epistaxis (26.6%), followed by gingivoragia (24.4%) and weakness (22.2%). Less frequently there were allegations of heavy menstruation (13.3%) which is specific to women of childbearing age. The rarest signs that have been recorded are hematuria (2.2%) and melena (2.2%) (figure 2).

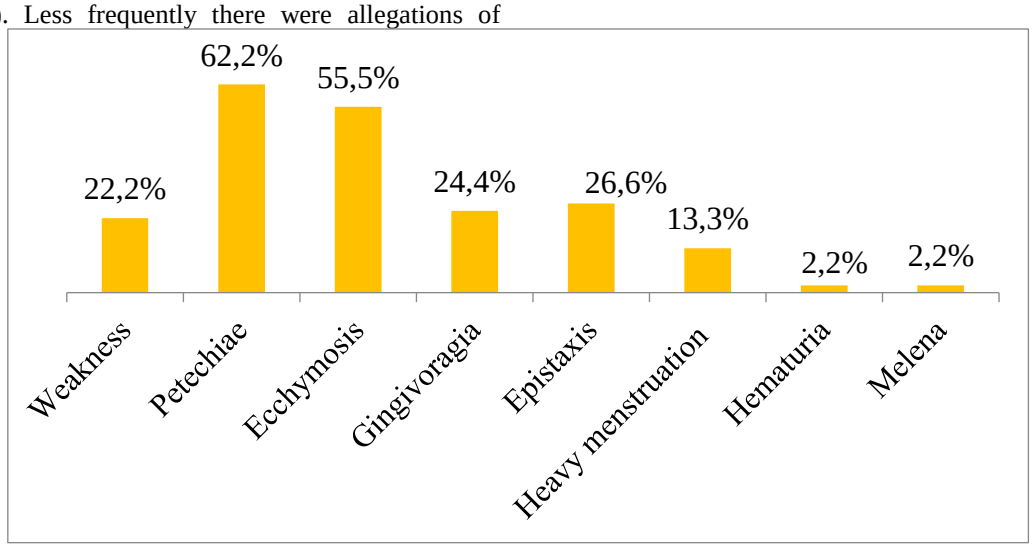

Figure 2. Frequency of clinical symptoms in patients with idiopathic autoimmune thrombocytopenia

At researching the results of general blood tests, attention was drawn to the number of platelets, the hemoglobin index, the number of erythrocytes and leukocytes. Thrombocytopenias were detected in all cases. In 13 (28.8%) patients the number of platelets varied between 20-50 $\times 10^9$/l, and in 32 (71.2%) cases solitary platelets were identified (figure 3).

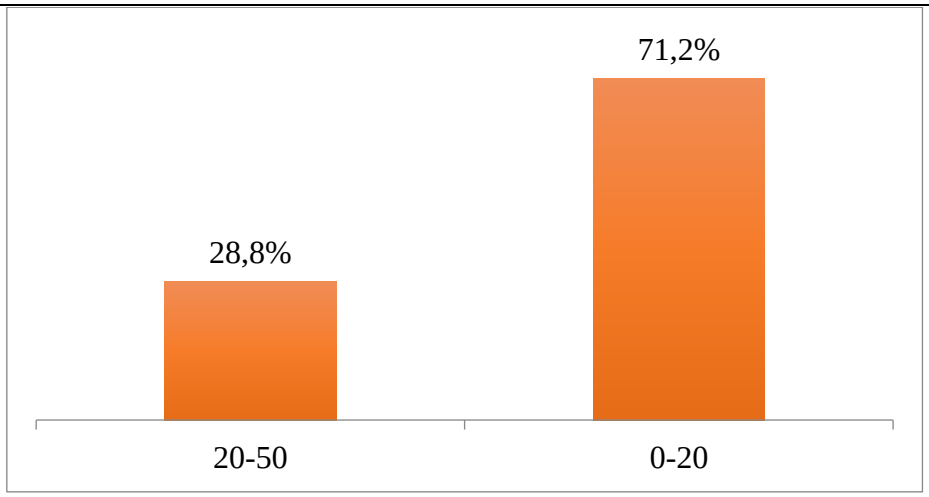

Figure 3. Distribution of patients according to platelet count

The hemoglobin index and the number of erythrocytes were within the normal range in 29 (82.3%) patients. Anemia was determined in 16 (21.3%) cases, of which grade I anemia was identified in 13 (13.3%) patients and grade II anemia - in 3 (4.4%) cases (figure 4).

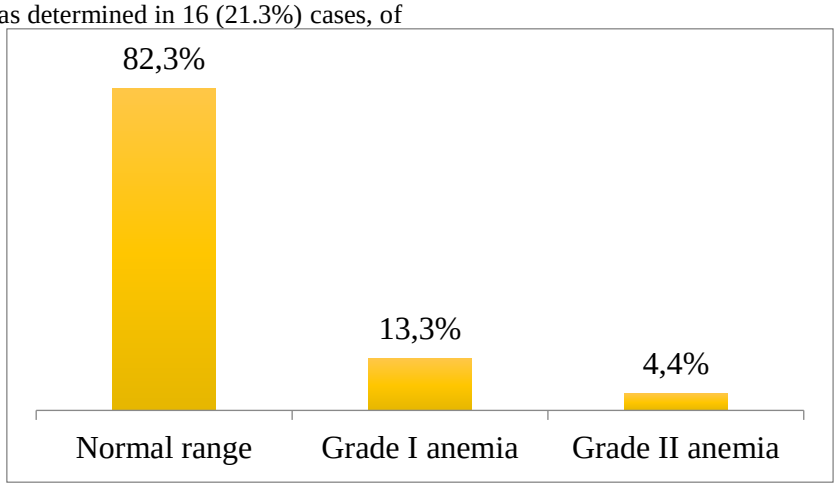

Figure 4. Distribution of patients according to hemoglobin and erythrocyte count indices

The analysis of the results of the bone marrow examination showed that in 16 (51.6%) cases the increase of megakaryocytes with the reduction of platelets was determined. In 8 (25.8%) patients megakaryocytes - normal and platelets reduced. In 7 (22.6%) cases there was a reduction of megakaryocytes and platelets (figure 5).

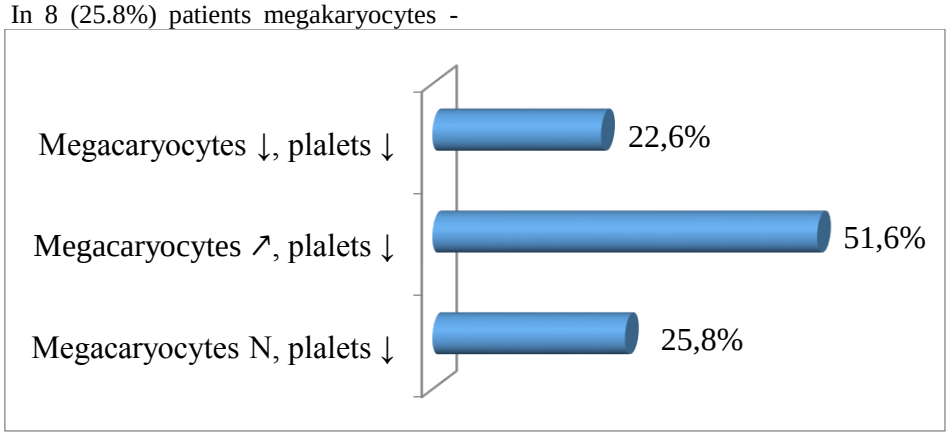

Figure 5. The results of the bone marrow examination

For the first line of treatment, glucocorticoid therapy at a dose of 1mg/kg was applied to all patients. The analysis of the effectiveness of the treatment of idiopathic autoimmune thrombocytopenia with glucocorticoids showed that the positive response, which was manifested by the suppression of the hemorrhagic syndrome and the increase in the number of platelets, was determined in 43 (95.6%) patients. In 2 (4.4%) cases no positive response to the administered treatment was obtained. Out of 43 patients with a complete positive ef-

fect on the background of glucocorticoid treatment, relapses developed in 37 (86.0%) cases. Remissions achieved after glucocorticoid therapy were short-lived and lasted up to 12 months.

Monoclonal antibody therapy - rituximab was applied to 5 patients with relapses after glucocorticoid treatment. In 3 (60%) cases a complete positive response was determined, but in 2 (40%) patients efficacy was lacking.

In 36 (89.7%) patients with relapses after glucocorticoid therapy, splenectomy was performed. Analysis of splenectomy results showed that complete positive response occurred in 35 (97.3%) cases. The lack of efficacy from splenectomy occurred in only one patient (2.7%). Relapse after splenectomy was recorded in only one patient.

The 5-year progression-free survival of patients with idiopathic autoimmune thrombocytopenia after splenectomy was high and constituted 91%. But the survival in the same terms of patients with a positive complete response after glucocorticoid therapy was equal to only 17% (figure 6).

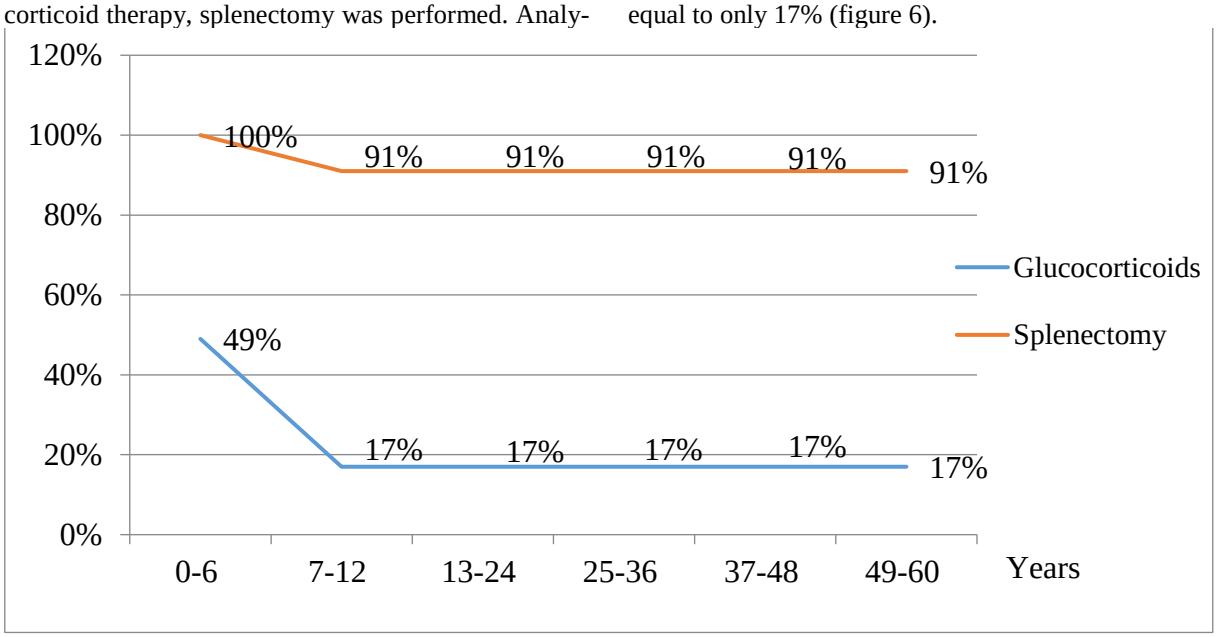

Figure 6. Progression-free survival of patients with complete response autoimmune thrombocytopenia

Thus, it was determined that the immediate and long-term results of the treatment of patients with idiopathic autoimmune thrombocytopenia were higher in cases of performing splenectomy as second-line therapy.

Conclusions

1. Idiopathic autoimmune thrombocytopenia was determined more frequently in people aged 30-49 years (46.6%) and predominated in women (65%).

2. The hemorrhagic syndrome in idiopathic autoimmune thrombocytopenia was more frequently manifested by petechiae (62.2%), ecchymosis (55.5%), less often - epistaxis (26.66%) and gingivoragia (24.4%).

3. In most cases (71.2%), in the general blood analysis the platelets were solitary, less often the platelets constituted 20-50×10^9/l (28.8%) and in the bone marrow examination more frequently (51.6%) an increase in megakaryocytes with a decrease in platelets was determined, and in 22.5% of cases with a decrease in platelets, a decrease in megakaryocytes also occurred.

4. Treatment efficacy was higher when splenectomy was performed. The 5-year survival of patients with splenectomy was 91%, as opposed to progression-free survival of 17% for patients treated with glucocorticoids.

References

1. Al-Samkari, Hanny, and David J Kuter. "Immune Thrombocytopenia in Adults: Modern Approaches to Diagnosis and Treatment." Seminars in thrombosis and hemostasis vol. 46,3 (2020): 275-288. doi:10.1055/s-0039-1700512

2. Guillaume Moulis, Aurore Palmaro, Jean-Louis Montastruc, Bertrand Godeau, Maryse Lapeyre-Mestre, Laurent Sailler; Epidemiology of incident immune thrombocytopenia: a nationwide population-based study in France. Blood 2014; 124 (22): 3308–3315. doi: https://doi.org/10.1182/blood-2014-05-578336

3. Justiz Vaillant AA, Gupta N. ITP-Immune Thrombocytopenic Purpura. [Updated 2022 Dec 23]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2023 Jan-. Available from: https://www.ncbi.nlm.nih.gov/books/NBK537240/

4. Marc Michel. Immune thrombocitopenic purpura: epidemiology and implications for patients. In: European Journal of Haematology. 2009, (82), pp. 3-7. https://doi.org/10.1111/j.1600-0609.2008.01206.x

5. Wang, J., Wang, B., Sun, Z., Xue, K."Therapeutic effects of rituximab combined with cyclophosphamide on refractory idiopathic thrombocytopenic purpura ". Experimental and Therapeutic Medicine 17, no. 3 (2019): 2137-2142. https://doi.org/10.3892/etm.2019.7196

6. Zufferey A, Kapur R, Semple JW. Pathogenesis and Therapeutic Mechanisms in Immune Thrombocytopenia (ITP). Journal of Clinical Medicine. 2017; 6(2):16. https://doi.org/10.3390/jcm6020016

PEDAGOGICAL SCIENCES

TEXTS OF THE STUDENTS IN PEDAGOGICS AS A MONOLOGUE AND A SOLILOQUY

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ТЕКСТЫ СТУДЕНТОВ, ПЕДАГОГОВ, КАК МОНОЛОГ И/ИЛИ СОЛИЛОКВИУМ

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Abstract

The research analyses practically proved model of text centered model of pedagogic and phycological profile of the students based on maximal effect in using of static and dynamic features of created/creating texts. Traditionally in university education in Bulgaria is related active participation with written texts-group work, solitary work, assuming resume or syllabus, report or research on specific problem, developing of conspectus of lessons, analysis of viewed lessons, summary of texts used in different situations, etc. The article suggests a model of slightly different model of analyzing and using of texts, created by students in the context of realization of the educational model based on reflexibility. The research is based on 284 texts created from March 2017 to October 2018 by students first and second year of education in The University of the Town of Shumen Bishop Konstantin Preslavski - Primary school teaching with a foreign language, Preparatory class teaching and Preparatory and primary teaching. The texts of the students have been viewed in two contexts static as a whole verbal product and dynamic as realized actions of producing and analyzing of the texts. The analysis of students' texts is done due to division either as a monologue or soliloquy with specific content, structure, formal and functional specifics. The effect of research and evaluating the texts with pedagogical themes is proved in the context of ruling educational motives-activity, reflexibility, motivation ,responsibility in self education.

Аннотация

Предлагаемое исследование анализирует уже устоявшуюся в практике текстовую модель ориентированного подхода к психолого-педагогическому портрету студентов, будущих учителей, в основе которой максимально и эффективно использованы статические и динамические ракурсы, созданные педагогами. По традиции университетское образование в Болгарии, которое готовит студентов педагогических специальностей, построено на активном использовании обратной связи: применение текстов – курсовых или самостоятельных работ с добавлением резюме или конспекта, доклад или реферат по конкретной педагогической проблематике. Также предлагается разработанный план-конспект предстоящих уроков, план практических занятий, анализ уроков после их завершения, в частности, сравнение текстов, которые были использованы в разных педагогических ситуациях и т.д. В статье рассматривается модель нетрадиционного анализа и использование студенческих текстов на педагогическую тему – в контексте реализации компетентностной учебной модели университетского образования, рассчитанной на рефлексивность. В основе исследования анализ 284 текстов, которые были созданы в период с марта 2017 года по октябрь 2018 студентами первого и второго курсов трех специальностей Педагогического факультета Шуменского университета им. Епископа Константина Преславского: „Педагогика начальной школы и иностранный язык", "Дошкольная педагогика", "Дошкольная педагогика и педагогика начальной школы". Анализ студенческих текстов сделан с точки зрения их характеристики – как монолог и как солилоквиум, обладающий специфическими содержательными, структурными, формальными и функциональными особенностями. Эффективность деятельности по созданию студентами текстов на педагогическую тематику объясняется в контексте ведущих учебных принципов – индивидуализации, самостоятельности и активности, мотивации, прагматичности, рефлексии и саморефлексии.

Keywords: text, monologue, soliloquy, reflex, student in Pedagogics, teacher
Ключевые слова: текст, монолог, солилоквиум, рефлексия, студент, педагог, учитель.

Введение. Социально детерминированные образовательные доминанты университетского образования в Болгарии на современном этапе предполагают необходимость в реализации учебной деятельности со студентами – будущими педагогами в среде, развивающей их как творческих и коммуникативных личностей, реагирующих целесообразно

и адекватно на различные изменения ситуации, умеющих генерировать и оценивать информацию, чтобы справляться с педагогическими проблемами, а также общаться толерантно и этично в разнообразном социокультурном контексте. Навыки работы с текстами в разнообразном дискурсе и типе речевой деятельности (создание, анализ, сравнение, редактирование, оценка) является одной из этих стратегий. В традиции во время университетского образования студентов, обучающихся на учителей в Болгарии активно включение обратной связи, основанной на текстовости. Она предполагает написание курсовых или самостоятельных работ, требующих резюме или конспекта, доклада или реферата по конкретной педагогической проблеме; разработку планов-конспектов предстоящих для проведения уроков; анализ наблюдаемых уроков; комментарии к текстам, предпочтенных в разнообразных педагогических ситуациях в обучении родному языку [2]. Настоящее исследование представляет апробированную в практике модель текстоцентрического подхода к педагого-психологическому портрету студентов, будущих учителей, основанного на максимально эффективном использовании и статических, и динамических ракурсов созданных/создаваемых педагогами текстов. Предпосылками выбора данной проблематики являются ведущие акценты в школьной практике обучения родному языку в Болгарии. Законодательно детерминированная компетентностная направленность и текстоцентричность современной образовательной парадигмы актуализируют значимость текста как объекта, цели и средства для достижения образовательных целей, воспитательных и социальных воздействий. „Ответственность“ за формирование навыков работы с текстом в школе является приоритетом обучения родному языку, в контексте которого, систематически и постепенно, целесообразно усваивать сущность, специфику, многообразные функции и основные характеристики текста. Все это обуславливает необходимость в компенетностных и коммуникативно ориентированных моделях (основанных на максимально эффективном использовании текстов и коммуникативных ситуаций) и в процессе университетской подготовки будущих учителей.

Цель, материалы и методы. Целью проведенного исследования является изучение возможностей университетской подготовки педагогов, основанной на текстоцентричности: установление, каким образом посредством более динамической/непринужденной работы студентов с текстами и над текстами, возможно образовательную модель сделать более эффективной в направлении к самостоятельной активности и ответственности за результативность (качеств, которым студенты должны научить и своих будущих воспитанников в качестве учителей). Задачи исследования имеют теоретические и прагматические акценты: выбор подходящих тем для разработки студентами-педагогами; анализ созданных текстов; апробирование моделей для дальнейшей совместной деятельности преподавателей и студентов с созданными текстами; обобщение положительных тенденций и построение перспективы. Исследование основано на анализе 284 текстов, созданных в период с марта 2017 до октября 2018 г. студентами первого и второго курсов трех специальностей Педагогического факультета, Шуменского университета им. Епископа Константина Преславского – „Начальная школьная педагогика с иностранным языком“, „Дошкольная педагогика“, „Дошкольная и начальная школьная педагогика“. В качестве объекта текстов для студентов-педагогов были выведены ключевые для педагогики/дидактики понятия – учитель, обучение, воспитание, обучаемый, педагогическая коммуникация, цели, результаты. Темы, над которыми проводилась работа, разнообразны, причем, часть из них были предложены самими студентами, а другая часть – преподавателем: „Рождаются ли хорошие учителя или они создаются“ (96); „Цель обучения ребенка состоит в том, чтобы сделать его способным развиваться дальше без помощи учителя“ (Е. Хаббард) (76); „Детям больше нужен пример, чем критика“ – Жозеф Жюбер (10); „Учитель и дерево познаются по плодам“ (украинская пословица) (14); „Плохой тот педагог, который забыл детство“ (6); „Дети умеют любить – их можно воспитывать только любовью“ (15); „Лучший учитель – талант, упорный труд или судьба“ (32); „Раскрыть в себе учителя и в учителе – себя“ (14); „Оценивать человека напротив тебя, рядом с тобой, такого как ты – проявление профессионализма и/или гуманизма“ (12); „Помогает нам ли обратная связь/оценивание/ становиться более компетентными? А более человечными?“ (9).

При представленной модели университетской подготовки работа над студенческими текстами была осуществлена в нескольких этапах: создание целостного текста каждым студентом; первоначальный анализ преподавателя/ей (современного болгарского языка, методики обучения родному языку); планирование и реализация совместных (преподавателя и студентов) работ по анализу созданных текстов с педагогической тематикой; обоснование выводов о целесообразной будущей реализации их в качестве учителей родного языка. Акцент в настоящей статье ставится на установленных конкретных моделях экспликации рассуждений студентов – будущих учителей.

Результаты. Тексты студентов свободны в жанровом отношении – не было поставлено условие о соблюдении определенной модели, но при этом фактом являлось некоторое предопределение жанра рассматриваемой проблематикой и формулировкой конкретной темы – ожидание создания текста-рассуждения/текста-эссе. Категорически доминирует предпочтение монологических текстов – 273 (96,13%). Только два текста были построены в диалоговом режиме – вопросы и ответы для интервью на выбранную тему. Фактом является отсутствие предпочтения диалоговых текстовых образований, несмотря на предоставленную свободу студентам в отношении формы и

модельности/структурированности их текста. Диалогический текст требует осмысления конкретного вопроса, логики вопросов; предполагает обязательную экспликацию ответов. Предпочтенные студентами монологические тексты могут быть осмыслены в условно обособленных двух моделях: чистые монологи и солилоквиуми (чаще монологические тексты с элементами солилоквиума). Монологи и солилоквииумы студентов отличаются друг от друга рядом своих характеристик – содержательных, жанрово-структурных, формально-грамматических, функциональных.

Студенческие тексты, построенные по традиционной монологической модели, представляют собой только эссе. Тематически они обвязаны с представлением педагогической проблематики в более обобщенном плане, с выдвижением общепринятого в научно-методической литературе педагогического/дидактического концепта. Предпочтения студентов, которые работали по этой модели, сведены к заданным преподавателем в качестве названий темам, касающимся перспектив и целей обучения, моделей оценивания, ожидаемым от учащихся результатам. Эти студенческие тексты опираются на цитаты из педагогики/дидактики; передают (часто в недостаточно корректной перифрастической форме), общие устоявшиеся постановки; не эксплицируют переосмысленные через собственную призму наблюдения над педагогической практикой; монологические аргументативные тексты часто актуализируют дефиниции (об учителе, обучении, педагогической коммуникации, оценке). В них аргументативные цепи о позитивах и дефицитах в обучении строятся путем ссылок на зарубежный опыт. Монологическая модель опирается преимущественно на нейтралитете высказывания, на безличную констатацию тенденций. Актуализированные позитивы, прежде всего, осмыслены как требования к учебно-образовательному процессу и к функциям учителя (активное изучение студентами в процессе обучения; обучение, создающее мыслящих людей, стимулирующее активность и инициативность, которое приводит к результативности; менторская роль учителя – направлять учеников, ориентировать их).

Понятие солилоквиум [lat. soliloquium < solo – один, один + loqui – говорить] определяется как диалогическое отношение к самому себя; как разговор с самим собой. (1) В научной литературе обычно это понятие связано с эстетическим контекстом – в театре, как говорение с самим собой/себе; как сценический монолог, цель которого – представить невысказанную мысль и рефлексию героя пьесы. Понятие осмысленное как отражение характера ситуации, как „внутренний дискурс“, который нашел свои литературные проявления в театральном монологе (драматическом монологе шекспировского Гамлета) или в нарративной технике „потока сознания“ Джеймса Джойса и других писателей XX века. В некоторых (доступных в интернете) учебных программах итальянской образовательной системы и научно-методических изданиях обнаружены постановки, связанные с требованием к обучаемым изучить солилоквиум, как форму коммуникации в художественном/нарративном тексте.

В данном исследовании была сделана попытка понятие *солилоквиум* актуализировать и осмыслить в образовательном контексте высшего образования в Болгарии, которое готовит учителей родного языка. Текст-солилоквиум опирается на внутреннюю речь, которая появляется во время размышления о самом себе. В соответствии с принятым нами пониманием, солилоквиум трактуется как монолог на более высоком уровне из-за категорически заявленной субъективной точки зрения в необычный языковой модели (речи, адресованной к самому адресанту или к отсутствующему собеседнику, который помогает выведению собственных мыслей, к аргументации собственной позиции). Тексты, построенны как солилоквиум, на темы, предложенные самими студентами („Детям больше нужен пример, чем в критика“ – Жозеф Жюбер), или они созданы по сознательно выбранному названию (из нескольких предложенных преподавателем) по проблемам, например: „Дети умеют любить того, кто их любит, и их можно воспитать только любовью“; „Учитель и дерево познаются по плодам“; „Раскрыть в себе учителя и учителя – в себе“. Из 169 таких текстов 148 построены как эссе, только 21 текст предложен по нетрадиционной структурной модели – дневник, письмо лучшему учителю, рассказ о пережитом, воспоминание. Тексты-солилоквиумы напоминают оригинальное духовное упражнение будущих педагогов, потому что в них рассматриваемая педагогическая проблема в большей или в меньшей степени переосмысляется в личностном плане, они персонально почувствованы, эмоционально активированы, очень часто у них оригинальное вербальное моделирование. Эти тексты, как будто тренируют мысль будущих педагогов, эксплицирующих проблемы функций, ролей и значимость хорошего учителя в контексте личностно пережитого/почувствованного и лелеянного, ожидаемого, страстно желаемого. Самостоятельно экспонированная афористичность конвертирует педагогические постановки; представляет их, в основном, через призму субъективно почувствованного, а не так модели запомненного педагогического правила: „Учитель-это человек, который показывает бульвар, а ученики сами должны узнать его улочки“; „Учитель несет на спине двойное бремя – быть одновременно представителем мира взрослых перед детьми и представителем мира детей перед взрослыми“.

Анализ ученических текстов позволяет обобщение наблюдений о структуре высказанной „солилоквиалности“ по двум моделям – вербальной эксплицированной и имплицитной закодированности в содержательном плане. Закодированная „солилоквиалность“ бытует как явное противоречие постановок в тексте, как спор точек зрения, как борьба между общепринятым и лично почувствованным, как противостояние между случившимся и предстоящим случиться в плане профессиональной реализации пишущего субъекта. Показательным для

модели является выбор текстов для ссылок – пословицы, поговорки, афоризмы („Что посеешь, то и пожнешь“, „Посредственный учитель говорит. Хороший учитель объясняет. Лучший учитель демонстрирует. Великий учитель вдохновляет“ – У.А. Уорд; „И каждый помнит только одного учителя – /на обрыве руку ему подал“ – Х. Харалампиев).

Експлицированность внутреннего диалога была осуществлена в ученических текстах двумя способами – с помощью вопросительных конструкций или посредством обобщающей, лично осмысленной констативности. Констативность связана с представлением точки зрения в диалогичной форме в афористическом плане: лаконический комментарий принятых постулатов других людей (Как говорит В. Ключевский, любовь является основой работы настоящего учителя – „чтобы быть хорошим преподавателем, нужно любить то, что преподаете, и любите тех, кому преподаете.“) или лично высказанное, как „крылатая мысль“ свое утверждение („Учитель – это одна из самых ярких фигур в жизни человека, так как оставляет прочный отпечаток на его личности“; „Быть учителем – это не профессия. Быть учителем – это призвание – самое высшее, самое трудное, самое благородное и самое ответственное призвание – создание людей“). Наблюдается и третья модель, представленная в виде цитат и собственных выводов в более обобщенном плане (не только непосредственно соотносимая с цитированием): „Есть два способа воспитания в школе – с любовью и без любви... „Вы не можете научить своих детей вести себя лучше, если вызываете в них плохие чувства. Когда дети чувствуют себя лучше, они и ведут себя лучше“ – Пэм Лео“; „Я бы хотела закончить цитатой на Януша Корчака, которую я принимаю как кредо и для школьного образования: „Люби своего ребенка таким, какой он есть – не талантливый, не удавшийся, взрослеющий. Когда общаешься с ним, радуйся, потому что ребенок – это праздник, который все еще с тобой“.

С расширенной фреквентностью в ученических текстах присутствует вербально експлицированная модель, реализованная с помощью вопросительных конструкций. Вопрос отправлен к самому себе или к неясному собеседнику (иногда это запомнившийся хороший учитель из собственного прошлого; а иногда – не идентифицированный анонимный адресат): Когда учащиеся имеют желание продолжать учиться после школы? Кто и как может продолжать свое развитие и без учителя? Достаточна ли констатация: „он рожден быть учителем“, чтобы определить учителя, как хорошего? Какой учитель хороший? Одинаково хорош ли один и тот же учитель для различных учеников? Встречаются и конструкции, построенные в плане риторичности – обращение к хорошему учителю, запомнившемуся на всю жизнь: „Добьюсь ли я твоего совершенства?“; „Как проявить достоинство, которому ты меня научил?“. В части студенческих текстов адресант и адресат совпадают: вопрос отправлен пишущим, и направлен к самому себе: „Смогу ли я открыть различные двери перед своими учениками?“.

В немалой части текстов за вопросами следуют ответы (полные или частичные) пишущего: „Каковы возможные подходы в общении между учителем и учениками? (доминирование учителя, или равенство между учителем и учащимися)“; „Чему не хочу учить своих учеников? Сложный вопрос со многими неизвестными“; „Что, на самом деле, для меня означает быть хорошим учителем? Быть хорошим учителем означает уметь учить детей с любовью и терпением, с пониманием. Позволить себе любить и принимать учеников, как своих детей, позволить себе быть их другом, советником, наставником, но не пытаться принимать решения вместо них. Хороший учитель должен делиться своими принципами и убеждениями с учениками, но не навязывать их или настаивать, чтобы они соглашались с ним“; „А что этого ценнее? Хороший, чуткий, внимательный, тактичный учитель проецирует через себя своих учеников“. Чаще всего внутренний диалог представлен студентами с помощью вопросов (единичных или ряда) без последующих ответов: „А могу ли я быть хорошим учителем?“; „Выполняет ли сегодня болгарский учитель свою важную роль?“. Создается впечатление о некоторой противоречивости – вопрос отправлен как будто к внешне выявленному, замеченному, а предполагаемый ответ предполагает внутреннего переосмысления, ощущения: „Каким должен быть современный преподаватель, чтобы остаться в сердце ученика навсегда?“; „Может ли мне помочь бесконечная уступчивость, чтобы быть хорошим учителем?“; „Не говорит ли язык тела о характере учителя?“; „Найду ли я, как учитель, ключ к детским сердцам?“. Иногда (при осмыслении неясных или проблемных педагогических моделей) и вопрос, и ответ были експлицированы с помощью вопросительных формул: „Но что означает быть учителем в наши дни? Повод для гордости, или для стыда и беспокойства?“. Найдено несколько текстов с експлицированным ответом/ответами без выраженности самого вопроса, например: „Итак. Ребенка можно сравнить с зеркалом. Он отражает любовь, но не начинает любить первым. Если дети получают любовь, они ее возвращают. Если не дать им любви, им нечего вернуть. Безусловная любовь отражается безоговорочно“; „Да, так и есть. Для меня мой первый учитель, не просто учитель, а человек, который научил меня быть честным и преданным, идти навстречу трудностям, справляться, не склоняя голову. Она была и есть моим духовным единомышленником“; „Действительно, быть учителем – это мастерство. Мастерство – это чувствовать ребенка, его ощущения и желания“. Иногда солилоквиальная модель является ответом на вопрос, заданный заголовком текста: „Я хочу оставить след, который любит, а не который ненавидит. Потому что дети умеют любить тех, кто их любит. Да, самая щедрая форма воспитания – это любовь“; „Также, как здоровое дерево приносит хорошие плоды, так и хороший учитель создает настоящих людей“; Если о нем хорошо заботились, дерево даст тебе вознаграждение. Если ученик попадает на хоро-

шего учителя, он благодарит не за ответ, а за вопрос, за активацию, за мотивацию“; „Так же, как здоровое дерево приносит хорошие плоды, так и хороший учитель воспитывает хороших учеников и настоящих людей“; „Говорят, что день узнается по утру, а дерево – по плодам. В древности люди не учились, как воспитывать детей, но следовали повелениям предков. Сегодня уже все по-другому. Мы технологическое и дигитальное поколение. Мы живем с помощью новых технологий, но все еще помним, что яблоня рождает яблоки, а тыква – тыквины. Вероятно, не далек тот день, в который яблоня может родить тыквины, а тыква даст яблоки. Это вопрос времени, а иначе говоря – все в наших руках, в хрупких руках будущих учителей“.

В своих текстах диалогически спроецированный анализ самого себя нынешние педагоги, будущие учителя, осуществляют в двух основных временных планах – прошлого и будущего. Существует немало примеров соизмерения самого себя с хорошим учителем из школьных воспоминаний („Возвращаясь в те школьные дни, перед нами возникает галерея образов. Это образы наших учителей. Некоторые из них, как бледные тени, исчезают, и ничего о них не помним. Но другие – яркие и незабываемые, как будто время не коснулось их. Это те учителя, которых все мы уважали и любили; которые научили нас не только тому, что преподают, а и вещам из жизни. Мы называем их хорошими учителями и помним их всю жизнь.“). Лучший учитель, выплывший из прошлого, это тот, кто поддерживал, вдохновлял, играл роль друга; в нескольких текстах он оценен параметрами святости.

Разнообразны, в семантическом отношении и в вербальной выраженности, соизмерения самого себя с учителем будущего. Студенты проявляют вербальную и эмоциональную креативность в своем футуристическом проецировании и обдумывании своей собственной педагогической реализации как хороших учителей: „Если вы хотите пойти по дороге хорошего учителя, то вы должны задавать вопросы. Вы должны научиться принимать различные ответы. Вы должны любить людей, которых будете спрашивать и от которых вы ожидаете ответа“. Модели эксплицируют предпочтение вербального выражения ожидаемого, убеждение и веру в возможное достижение желанных характеристик (я надеюсь; я считаю, что; я уверен). Социально-педагогическая активность, спроецированная в плане будущности, начинает говорить и языком категоричности, необходимости (императивные глагольные формы, составные глагольные сказуемые с модальным глаголом *должен*, сложные предложения с глаголом *хотеть*: я должен узнать, я хочу, чтобы меня понимали; необходимо изменить): „Хороший учитель должен быть терпеливым, психически устойчивым, толерантным и вести себя с детьми как с равными. Успешный учитель должен уметь создавать связь со своими учениками. Он должен быть чутким по отношению к их чувствам и эмоциям“; „Хороший учитель должен быть очень хорошо подготовленным, быть в курсе всех инноваций, но и быть обаятельной и очаровательной личностью, которая вдохновляет своих учеников, открывая им просторы необъятного мира науки“; „Учитель должен быть не только педагогом, но и психологом, эстетиком, исповедником.“ Мысль студентов фиксируется не только на собственной визии в образовательном пространстве, но и на присутствии собственного я среди других, на утверждении себя на фоне других („Никогда не поздно научиться быть хорошим учителем“; „Я надеюсь владеть ситуациями, быть учителем, который слышит и чувствует детей“; „Мысль, что можешь быть полноценным и полезным для кого-то, стимулируют учиться еще больше и больше“; „Большое богатство в будущем быть частью детской мечты и смеха“). В участках, откуда приведены отрывки, студенческие тексты звучат как сложное психолого-эмоциональное самоутверждение/самоубеждение вербального не эксплицированного вопроса к самому себе.

Различные примеры показывают общие тенденции эксплицированного, "интепретативного", "самооценивающего" и "самоанализирующего" диалога с самим собой. Единичные или ряды вопросов к самому себе ("*я*" или "*мы*" формы) в некоторых текстах, как будто направлены на внутреннее изучение самого себя, на сознательный поиск познания самого себя, которое не принимает однозначности трактовок и выводов в педагогической, дидактической и методической литературе: „Что нужно дать детям в нашем качестве учителей? Как не отметить "выгорание" учителей в течение долгих лет преподавательской деятельности?“; „Помогут ли примеры из моего школьного прошлого моему будущему как учителя?“. Тексты, в которых обнаруживаются проявления солилоквиума, чужды трафаретной модели, готовой истине. Даже в своей иногда примитивной или наивистичной афористичности, эти тексты звучат гораздо человечнее, откровенно и открыто.

Выведенные особенности текстов, построенных по модели солилоквиума или содержащих его (солилоквиума) элементы, свидетельствует о возможности продолжения разговора по начатым в них (автора с самим собой или с воображаемым собеседником) темам: о провокативности и неоднозначности происходящего в сфере образования, о сложности педагогической коммуникации; разнообразной вариативности взглядов субъектов в образовательном процессе, о многоаспектности их взаимных влияний, об обязанностях по дороге просвещения и воспитания людей.

Преимущественно в университетской практике последующая работа над созданными текстами студентов (подготавливаемых на учителей родного языка) направлена на отработку овладения на литературно-языковыми и стилистическими нормами и правилами текстовой грамматики (информативности и связности; релевантности, эффектности и эффективности текста). Бесспорной (в представляемой нами практике) оказалась эффективность комбинации двух моделей активизации студентов с помощью текстов – с одной стороны,

как создателей, а с другой, – в качестве аналитиков собственного текста или текстов однокурсников. Это происходит в связи с представленной педагогической проблемой или с какой-либо конкретной педагогической ситуацией. Деятельность по разработке текстов и их последующего анализа студентами в педагогическом контексте основывается на нескольких ведущих учебных принципах – индивидуализации, самостоятельности и активности, мотивированности, рефлексивности и саморефлексивности, ответственности за собственное обучение. В апробированной нами модели тексты студентов использованы многогранно – и в языковом, и в дидактико-методическом контексте. Глубокое „погружение“ в текст осуществляется посредством активного участия в различных ролях: главных (автора, редактора, методиста, учителя, ученика) и второстепенных (соотносимых с многообразными функциями учителя – информатора, руководителя, фасилитатора, посредника, оценивающего, друга, координатора, помощника, советника, диагностика, мотиватора и др.). Их анализ осуществляется в контексте диалогичности – при интерпретации педагогических проблем и постановок. Подобного рода аналитико-практические мероприятия оказываются целесообразными в процессе уточнения понятий по дидактическим и методическим дисциплинам; в процессе разработки и осмысления целей, при анализе речевой и поведенческой модели настоящих/будущих учителей, во время дискуссий об адекватности методов преподавания и оценки; способствуют формированию высших интеллектуальных способностей, связанных с критичностью, проблемностью, мотивированностью. Модель работы оказалась эффективной и в контексте своей интерактивной реализуемости. И если текст является своеобразной фазой/результатом эмоциональной речевой деятельности студента-педагога, последующая работа со студенческими текстами ассоциируется с более высокой стадией – рефлексии и саморефлексии, дальнейшего развития собственных мыслительных операций. Личное переосмысление ведущих положений педагогики, дидактики и методики в текстах студентов, их дальнейшая актуализация и/или дискредитация в более конкретном контексте – коммуникативно-прагматической направленности методики обучения родному языку – способствуют активизации психических процессов и речевых действий, для обнаружения точки пересечения интеллектуальной диалогической и праксиологической рефлексий (2) [1: 185]. Подобного рода диалогическое продолжение монолога и солилоквиума в виде диалогических образовательных форматов (семинаров, бесед, споров, круглых столов) развивает умения будущих учителей работать с информацией – осмыслять/оценивать уже написанное ими через призмы объективности, адекватности, актуальности, откровенности, искренности. Апробированная модель оказалась благоприятной и с точки зрения возможностей для переосмысления собственной и чужой точки зрения, на основе сформированного опыта, чтобы адекватно и правильно критически выразить отношение к идеям других участников педагогического процесса (как в университетском, так и в школьном образовании, в котором студентам предстоит стать участниками в роли учителей). Эффективность модели обеспечивается в контексте преимущества стратегии критического мышления, коллаборативного обучения, стиуативно-контекстного и фасилитационного обучения, включения интерактивных образовательных методов и технологий (прерванная логическая цепочка, чтение с пониманием, INSERT /интерактивная система для эффективного чтения и мышления путем пометки на полях/, маркировочная табличка, мозговой штурм, запись идей, метод 365, панельная дискуссия, ролевые игры, обучение на опыте других, модель шести мыслящих шляп Эдварда де Боно, различные типы фасилитации и мн. др.) [3]. В подобного рода образовательном контексте развиваются умения, обеспечивающие включение студентов в заданные им разнообразные роли, как будущих учителей – коммуникативная, конструктивная, организаторская, гностическая и др.

Выводы. Идентичность связана со знанием, с осознанием, с рефлексией. Ответственным и откровенным написанием текстов и толерантным их дальнейшим обсуждением в прагматическом контексте, студенты как будто подтверждают истину, что для достижения настоящей и будущей идентичности в плане образованности, педагогической коммуникации, возможно только путем рефлексивности и саморефлексивности; путем образования, которое успешно формирует духовно богатых личностей. Модель успешно активирует процессы формирования и развития рефлексивной компетентности, которая осмысляется как „необходимое условие для повышения профессионализма и педагогического мастерства учителей“, и принимается как „профессиональное качество личности, позволяющее наиболее эффективно осуществлять рефлексивные процессы“, способствующие творчеству в деятельности по развитию и саморазвитию [4: 319 – 320]. Университетское обучение будущих учителей, базирующееся на текстоцентричности, ориентированное на рефлексивности, основывающееся на интерактивности, индивидуальности и практике, дает свои положительные результаты в адекватной современным требованиям подготовке студентов, будущих учителей в направлении связи психологии рефлексивности с педагогикой творческого мышления. Помогает студентам-педагогам, активно, мотивировано и ответственно, участвовать в процессах развития профессиональных компетентностей, усваивать стратегии (учения, коммуникации, оценивания), что позволяет дальнейшего личностного и профессионального развития и за пределами университета при реализации их как учителей, которые не только должны обучать учеников, но и формируют личностей.

Примечания:

(1) С целью определения и характеристики концепции солилоквиума (soliloquium) использованы следующие источники Интернет:

https://www.merriam-webster.com/dictionary/soliloquy (Доступ 12.01.2018г.)

https://www.litcharts.com/literary-devices-and-terms/soliloquy (Доступ 12.01.2019 г.)

https://docplayer.it/94377-Laboratorio-delle-competenze-comunicative.html (Доступ 18.01.2019г.)

http://nilolay-pulp-fictions.blogspot.com/2013/06/blog-post_6178.html (Доступ 18.01.2019 г.)

https://dic.academic.ru/dic.nsf/dic_fwords/33851/%D0%A1%D0%9E%D0%9B%D0%98%D0%9B%D0%9E%D0%9A%D0%92%D0%98%D0%A3%D0%9C (Доступ 20.03.2019 г.)

(2) Термин "праксиологическая рефлексивность" является эквивалентом сложного психического феномена регулирования, контроля и осмысления эффективности использования прагматических программ и действий. В болгарской научной литературе термин *праксиологический* понимается в контексте рефлексивности В. Василевым. Автор приводит конкретные направления и особое содержание рефлексивного процесса; связывает понятие *праксиологическая рефлексия* с размышлениями, посредством которых субъект выбирает необходимые и наиболее подходящие знания, чтобы реализовать конкретную практическую деятельность. Он понимает понятие, как эквивалент мыслительных процедур, с помощью которых готовится, регулируется и контролируется превращение определенных знаний в средства для решения профессиональных и жизненных практических задач [1].

References

1. Vasilev, V. (2006). Reflection in knowledge, self-knowledge and practice. Plovdiv: Makros.

2. Georgieva, S.D. (2018). The text-centric approach to creating a professional-value portrait of the teacher. – Psychological science and practice. Moscow: RUDN, c. 246 - 251.

3. Gyurova i dr. Gyurova, V., Dermendzhieva, G., Bozhilova, V., Varbanova, S. (2006). The learning process adventure. The University Teacher's Guide. Sofiya: EVROPRES.

4. Ivanova, R. (2016). About the reflective skills and competencies of the teacher. – Strategies of educational and scientific policy. vol. 24, no 4, pp. 317 – 328.

PHILOLOGICAL SCIENCES

LANGUAGE COACHING: A PATHWAY TO EFFECTIVE COMMUNICATION

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Abstract

Language coaching is an individually tailored approach to language learning that focuses on the specific needs and goals of the learner. Rather than following a traditional language learning curriculum, a language coach works one-on-one with the learner to create a unique learning plan that meets their individual needs. This approach is highly effective because it allows learners to concentrate on the areas they need to improve the most, while also building their confidence and motivation. Language coaches are typically highly trained and experienced language professionals who possess not only strong language skills but also the ability to motivate and guide learners towards their goals. They use a variety of techniques and strategies to help learners improve their language skills, including goal-setting, feedback, and reflective questioning.

Keywords: language coach, speaking fluency, language skills, collaboration, intercultural communication, customized training, learning goals, self-awareness.

As globalization and multiculturalism continue to shape our world, the ability to communicate effectively in different languages is becoming increasingly important. This has led to the rise of language coaching, which is a process where a trained language coach works with an individual or a group to improve their language skills.

Language coaching is different from traditional language teaching in that it meets the individual's specific needs and goals. It is a personalized approach to language learning that considers the learner's personality, learning style, and goals. The language coach provides guidance and support throughout the learning process, helping the learner to identify their strengths and weaknesses and develop strategies to improve their language skills.

The benefits of language coaching are many. Firstly, it helps to develop more effective communication skills in different languages, which is crucial for individuals and organizations operating in a globalized world. Secondly, it provides learners with a sense of ownership over their learning process, which can lead to a greater motivation and engagement. Thirdly, it promotes self-reflection and self-awareness, which are important skills for personal and professional development.

Language coaching is also highly adaptable and can be used for a wide range of language skills, from general communication skills to business language skills, and even specialized language skills such as medical or legal terminology. This flexibility makes language coaching an attractive option for individuals and organizations alike. It can also help learners to build their confidence and communication skills, as well as develop a deeper understanding of the language and culture they are studying.

One of the key features of language coaching is the focus on real-life communication situations. Unlike traditional language teaching, which often emphasizes grammar and vocabulary, language coaching prioritizes the development of practical language skills that can be immediately applied in real-life situations. This includes skills such as active listening, cultural awareness, and interpersonal skills.

Language coaching also uses a variety of techniques and tools to support language learning. These may include role-playing exercises, language immersion experiences, self-assessment tools, and personalized feedback. The language coach works closely with the learner to develop a customized learning plan that addresses their specific needs and goals.

In addition to the benefits for individuals, language coaching can also have a positive impact on organizations. It can improve communication within the organization, help employees to work more effectively with clients and customers from different cultural backgrounds, and enhance the organization's reputation as a multicultural and inclusive workplace.

As businesses become increasingly globalized, it's important for professionals to have strong communication skills in multiple languages. This is where language coaching can be particularly useful, as it can provide personalized training to help individuals improve their language proficiency for business purposes.

One of the key benefits of language coaching is its ability to provide customized instruction that is tailored to the specific needs of the client. For business clients, this may involve developing language skills that are

particularly relevant to their industry or profession. For example, a businessperson working in the tech industry may need to focus on developing their English language skills for technical presentations or conferences.

Another advantage of language coaching is the flexibility it provides. Coaching sessions can be scheduled around a busy work schedule, and can be conducted remotely via video conferencing or in-person. This allows business clients to fit language learning into their already packed schedules, without sacrificing productivity or work efficiency.

In addition to providing language instruction, language coaching can also help business clients improve their cultural competency. This is particularly important when working with international partners, as cultural differences can have a significant impact on business negotiations and partnerships. Language coaches can help clients develop an understanding of cultural nuances and etiquette, allowing them to build stronger relationships with their global partners.

Language coaching can also provide significant benefits to businesses as a whole. By investing in language coaching for their employees, businesses can develop a more diverse and inclusive working environment, and can improve their ability to compete in global markets.

Finally, it's worth noting that language coaching can be a highly rewarding experience for business clients. Learning a new language can be challenging, but it can also be incredibly empowering. By developing their language skills, business clients can open up new opportunities for personal and professional growth, and can feel a sense of accomplishment as they achieve their language learning goals. Language Coaching for Business Clients can provide a valuable tool for professionals who are looking to improve their language proficiency for business purposes. By providing customized instruction, flexibility, cultural competency training, and overall benefits for businesses, language coaching can help individuals and companies alike thrive in an increasingly globalized economy.

Process itself

As language coaching is a personalized and goal-oriented approach to language learning that has in view the individual needs and interests of the learner, it involves a collaboration between the coach and the learner to design a learning plan and set achievable goals, with regular feedback and support from the coach.

The coaching process begins with an assessment of the learner's current level of proficiency and an exploration of their goals, needs, and interests. Based on this information, the coach designs a learning plan that takes into account the learner's strengths and weaknesses, as well as their preferred learning style.

The learning plan typically involves a combination of language instruction, practice, and application. The coach may recommend specific learning materials or resources, such as textbooks, online courses, or podcasts, depending on the learner's needs and preferences.

One of the key features of language coaching is regular feedback and support from the coach. The coach provides ongoing guidance and encouragement, helping the learner to stay motivated and on track with their learning goals. They may also provide specific feedback on the learner's language use, helping them to identify areas for improvement and providing strategies for improvement.

Language coaching can take place in a variety of settings, including in-person, online, or through a combination of both. Many language coaches use video conferencing tools like Skype or Zoom to connect with learners around the world.

Stages involved in Language Coaching

Initial Assessment: The first stage in language coaching is an initial assessment of the learner's current language level, goals, and needs. The coach and learner will discuss the learner's background, reasons for learning the language, and the specific areas where the learner wants to improve.

Goal Setting: Based on the initial assessment, the coach and learner will work together to set specific and measurable language learning goals. These goals should be achievable and realistic, and aligned with the learner's overall objectives.

Learning Plan Design: With the goals in mind, the coach will design a personalized learning plan that takes into account the learner's strengths, weaknesses, learning style, and preferences. The plan may include language instruction, practice exercises, and real-world language use.

Instruction and Practice: The coach will provide instruction on specific language skills and concepts, and guide the learner through practice exercises to reinforce learning. The learner will receive feedback and support from the coach throughout the process.

Application: The coach will provide opportunities for the learner to apply their language skills in real-world situations. This may involve role-playing, conversation practice, or other activities that simulate authentic language use.

Ongoing Assessment and Feedback: Throughout the coaching process, the coach will assess the learner's progress and provide ongoing feedback and support. The learner will have the opportunity to reflect on their progress and adjust their learning plan as needed.

Final Evaluation: At the end of the coaching program, the coach and learner will evaluate the learner's progress and success in achieving their language learning goals. The coach may provide recommendations for further study or areas for continued improvement.

Potential outcomes

Improved Language Proficiency: One of the primary goals of language coaching is to improve the learner's language proficiency. Through individual instruction, practice, and application, learners can develop stronger language skills and gain greater fluency in speaking, listening, reading, and writing.

Increased Confidence: Language coaching also helps learners to build their confidence in using the language. By providing regular feedback and support, the coach can help learners to overcome their fear of making mistakes and feel more comfortable communicating in the language.

Enhanced Communication Skills: Language coaching can also help learners to develop stronger communication skills. By practicing real-world language use and focusing on the specific areas where the learner wants to improve, learners can become more effective communicators in their personal and professional lives.

Greater Cultural Understanding: Language coaching can also provide learners with a deeper understanding of the culture and customs associated with the language they are studying. By exploring cultural differences and practicing language use in different contexts, learners can gain a greater appreciation for the people and traditions associated with the language.

Achieving Learning Goals: Ultimately, the goal of language coaching is to help learners achieve their language learning goals. Whether the learner's objectives are personal, academic, or professional, language coaching can provide the support and guidance needed to achieve success.

Overall, language coaching is an effective and flexible approach to language learning that offers a range of benefits for individuals and organizations. It is an individual-oriented approach that prioritizes the development of practical language skills and promotes self-reflection and self-awareness. As the world becomes increasingly interconnected, language coaching is becoming an essential tool for effective communication across cultures and languages.

References

1. Grant, A. M., & O'Connor, S. A. (2015). The differential effects of solution-focused and problem-focused coaching questions: A pilot study with implications for practice. Industrial and Commercial Training, 47(2), 102-109.

2. Nieuwerth, C., & Wesselink, R. (2016). A language coaching model for corporate settings: A Dutch case study. International Journal of Evidence Based Coaching and Mentoring, 14(1), 84-98.

3. Stachowiak-Szrejbrowska, A., & Lyczek, A. (2018). The role of coaching in second language acquisition: A literature review. Journal of Teaching English for Specific and Academic Purposes, 6(1), 133-149.

4. van Wijk, C., & Valcke, M. (2017). An exploratory study of the effects of language coaching on student motivation and self-efficacy in a Belgian university setting. System, 65, 88-100.

5. Arnold, J. (2019). Coaching for foreign language teachers: Benefits, challenges and practicalities. ELT Journal, 73(3), 279-288.

6. Hughes, J. (2016). Language coaching: An exploration of the potential for innovation. In M. Milanovic & C. Leijten (Eds.), Innovative approaches to teaching and learning foreign languages (pp. 177-188). Springer.

7. Lytkina, O.I., Ponomareva, A. Yu. (2019). Prinsipy yazykovogo kouchinga v prepjdavanii inostrannykh yzzykov [Principles of language coaching in teaching foreign languages] [Published in Russian].

8. Kosstrov, Yu. B., Shabarshina, O. Yu. 2019). Kouching kak inovatsionnyya obrazovatelnaya tekhnologiya [Coaching as a principal educational technology] {Published in Russian].

TECHNICAL SCIENCES

PEDAGOGICAL ERGONOMICS: The POSSIBILITIES of AI, ZKP, and ML

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Abstract
Pedagogical ergonomics deals with the issues of rationalization of teacher's work and students' learning. The subject of pedagogical ergonomics is "human - educational environment". In recent years the educational environment has changed significantly under the influence of the process of its digitalization. It changes the psychology of teachers and students, gives rise to a number of safety issues and new aspects in the ergonomics of the educational process - its efficiency, rationality, safety, which remain little-studied. This article examines the use of artificial intelligence, zero-knowledge proof technology and machine learning in education from the perspective of basic principles of ergonomics - performance, efficiency, comfort of educational work, its safety. The article shows that digitalization of the educational environment helps to solve a number of problems of pedagogical ergonomics and serves to improve the quality of education and its accessibility for all. At the same time, the problems of using artificial intelligence in education are also noted. The possibilities of zero-knowledge proof technology that can help to reduce the risks of digitalization of the educational environment are considered.

Keywords: ergonomics, education, artificial intelligence, machine learning, zero knowledge proof.

Ergonomics is the science and practice aimed at adapting the subject world to human needs for safe and efficient work. The aim of pedagogical ergonomics is the study and design of optimal material and organizational conditions of teacher and student activity in the educational environment. Pedagogical ergonomics is an applied branch of pedagogy. It is aimed at improving the efficiency and quality of learning, personal development and maintaining the health of participants in the pedagogical process, Pedagogical ergonomics considers the educational process as an ergonomic system "learner - educational environment".

Ergonomics of the educational process is the rationalization of the teacher's work and students' learning work. Ergonomics of educational environment is not only the architecture and design of rooms. It is also about the ergonomics of learning tools. A properly organized environment is called "a hidden curriculum", "the third teacher" (after the family and the teacher). In fact, the educational space is the philosophy of the school, it is a format of socialization of the child by forming a school identity [3].

The approach to the ergonomics of the educational environment is in line with humanistic pedagogy, within the framework of the holistic approach to the child. L.S.Vygotsky warned that the child and the environment cannot be considered separately. He wrote that the development of the child is not a puppet controlled by pulling two strings - "personality" and "environment". In the 21st century this approach becomes even more relevant. The learning environment is changing rapidly. It is becoming technogenic: it includes artificial intelligence and global communication information networks. Today we are talking about "weak", "narrow" artificial intelligence. These are programs that perform routine human functions (translation, image recognition, calculations). "Strong" AI is a machine capable of thinking like a human, being aware of itself, learning new things [6].

When will strong intelligence be created and will it be able to surpass humans? Let's not guess. We must recognize the fact that the weak intellect has already made its way into our lives and helps to automate the actions traditionally performed by humans.

The digitalization of the educational environment is also changing the human being. The line between subject and object is being erased. The boundary between "internal" and "external" intelligence is dissolving. The subject is embedded in an environment of artificial intelligence, which optimizes the activity of his brain. The brain as an instrument of cognition and artificial intelligence become closely linked. Mental functions are seen as embodied in the human body and at the same time as existing independent entities. Intellect becomes an emergent property of the complex human-environment system.

The main goal of pedagogical ergonomics is to increase the efficiency of learning activities, health preservation (safety) and personal development (comfort, satisfaction with the content, forms, results of activities), to ensure optimal efficiency, child's satisfaction with learning work, teacher's satisfaction with the quality of teaching as an important condition for achieving SDG 4 - improving the quality and accessibility of education for all [2]. According to OECD experts, the practical solution to this problem is the inclusion of educational IT products based on artificial intelligence (AI), big data, machine learning, as well as the use of ZKP - zero knowledge proof.

The development of artificial intelligence is changing human mental functions. Human intelligence is losing its purely human properties. If today AI algorithms are involved in ergonomics still in a fragmented way, then in the near future it will probably be impossible to imagine teaching ergonomics without the participation of artificial intelligence (AI), which will control the whole process from start to finish.

The digital educational environment is called the teacher of the future, which will be able to open up new opportunities for everyone, to raise to a higher level the ergonomics of educational work.

Today, artificial intelligence is effective where there is standardization and algorithms. But it is possible that in the near future machine learning will be able to create questions to the learning material and recognize answers given in arbitrary form, for example, in essays. Machine learning can help personalize the learning route, developing a different educational track for each student. It can reduce learning time, increase the quality of learning material. It helps to find information from different sources; plan and draw conclusions based on the data obtained. AI is used to check the completed tasks. It finds mistakes (grammatical, punctuation, and even semantic) better than the average teacher-expert. This saves teachers up to 20% of their time and reduces the chance of subjective evaluation [4].

AI quickly learns and evolves from large amounts of data; adapts to real-time mode and even analyzes itself in terms of behavior, errors, and success.

AI is guided by an ergonomic task: to take the best possible (rational) action in (any) situation in terms of efficiency, quality, safety and accessibility of the educational process for all participants.

Machine learning helps to adapt the educational process to the needs of learners and the needs of the labor market.

AI performs systematic analysis of learning performance indicators, automates assessment of the quality of knowledge and analysis of information on learning outcomes.

AI helps identify children with outstanding abilities. C. Daggan notes that AI plays an important role in implementing a personalized approach to education. It can adapt the teaching material, content and pace of learning taking into account the specific needs of each pupil/student. The student will be able to independently plan an educational trajectory, set and select meaningful learning goals. Thus, AI becomes a tool for motivating students to learn [1].

In recent years, AI has learned to identify gestures and recognize speech. It is used for early diagnosis and prediction of fatigue, symptoms of vascular dystonia, and chronic diseases.

AI is indispensable for ensuring the psychological safety of the educational process and protecting children from dangerous and unwanted information.

The M-Write platform assesses students' residual knowledge and also teaches users the rules of academic writing.

Artificial intelligence is unbiased, unlike university professors, and can provide an objective assessment of the quality of the learning process and students' progress. It stimulates the educational process by regularly informing students about achievements and mistakes.

To summarize, the following areas of application of AI in the educational space can be identified. Adaptive learning, which provides individualized learning for each school/student. Personalized learning through a wide range of educational programs, which differ in methods and pace of learning. Automated assessment (analysis of answers, feedback, new learning tasks taking into account the weaknesses and strengths of the pupil/student). Interval learning, aimed at reinforcing the material learned, to get a stable knowledge. Control of the examination process in distance learning (allows you to determine whether the answer of the pupil/student is independent or not - using hints, Internet resources). Intellectual assistant (answers students' queries that are related to learning). Inclusive education (providing education for all - access to educational resources for children with different educational needs). Tutoring (AI identifies a problem area and creates individualized assignments to fill knowledge gaps). Behavior analysis with cameras (examines the emotional and physical state of students "here and now" in the learning process).

The expediency of creating virtual teachers and assistant bots, and the need to define the limits of their use in education are debated.

Scientists distinguish four main groups of tasks that AI can solve: 1) selection and admission of students, 2) acceleration of learning, 3) student tasks, 4) optimization and adaptation of educational programs.

A promising direction for the development of AI educational technologies in the coming years will be comprehensive automation systems that control all elements of the educational process without exception.

The American educational platform Stellic promises full automation of the educational process of universities. The main goal of the platform is to improve the quality of education: "To help each student get the most out of his or her studies.

Meanwhile, AI is not free from drawbacks. One of them, which is often discussed, is the danger of unauthorized access by AI to information about students' and teachers' private lives. This reduces the safety and comfort of the educational process for its participants and their trust in digital technology. In addition, the participants of the process understand that it is extremely difficult to prove the fallacy of AI conclusions, to identify its errors and to appeal against them, because access of outside experts to such systems is closed. In this regard, we would like to mention the possibilities of combining AI with ZKP - zero- knowledge proof, or zero- knowledge protocol [5].

This is a method of proving the truth of a statement without transmitting any additional information other than the fact that the statement is actually true. The goal of the method is to prove the very fact that the information is true without revealing the information itself or any additional information. What is proved is the

statement itself that the proving person has true knowledge, but without communicating the knowledge itself (zero- knowledge). A zero- knowledge proof is an assertion of the fact that the verifier possesses classified information. A distinction is made between interactive zero- knowledge proofs and non-interactive proofs. Interactive protocol refers to the direct exchange of information between the parties.

Thus, the protocol in question requires interactive input from the verifier, usually in the form of a problem or a problem. The goal of the prover in this protocol is to convince the verifier that he has a solution, without giving away even part of the "secret" evidence ("zero knowlage"). The verifier's goal, on the other hand, is to make sure that the proving party is "not lying."

Zero-knowlage proof protocols have been developed that do not require interactive input data.

In this case, the proof relies on the assumption of a perfect cryptographic hash function, that is, its output cannot be predicted if its input is not known. Zero-knowlage proof is used in several blockchains and is used to verify the existence of information without transmitting the information itself.

Conclusions. Digitalization of the educational environment in terms of pedagogical ergonomics remains an underdeveloped area. Studies have shown that artificial intelligence, machine learning, and ZKP can improve the ergonomics of the educational process - the efficiency and rationality of teacher's work and student learning. The most vulnerable are the conditions of safety and psychological comfort of the digital educational environment for students because of the danger of personal space violation and leakage of personal data. However, modern technological solutions to help artificial intelligence can come to the aid of its improvement.

References

1. Duggan, S. (2020) AI in Education: Change at the Speed of Learning. UNESCO IITE Policy Brief.
2. Hornbaek, K (2006). "Current Practice in Measuring Usability: Challenges to Usability Studies and Research". International Journal of Human-Computer Studies. **64** (2): 79–102. doi:10.1016/j.ijhcs.2005.06.002.
3. Lee, J.D.; Wickens, C.D.; Liu Y.; Boyle, L.N (2017). Designing for People: An introduction to human factors engineering, 3nd Edition. Charleston, SC: CreateSpace. ISBN 9781539808008.
4. Makridakis, S. (2017) The forthcoming Artificial Intelligence (AI) revolution: Its impact on society and firms // Futures. 2017. Vol. 90. P. 46–60.
5. Peng K. Attack against a batch zero-knowledge proof system // IET Information Security IET, 2012. **6** (1), 1—5. doi:10.1049/IET-IFS.2011.0290
6. Russell, S., Norvigm, P. (2020) Artificial intelligence: A Modern Approach. 4-th Ed. – New Jersey: Prentice Hall, 2020. 1136 p
7. Russell, Stuart J.; Norvig, Peter (2021). Artificial Intelligence: A Modern Approach (4th ed.). Hoboken: Pearson. ISBN 9780134610993. LCCN 20190474.

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