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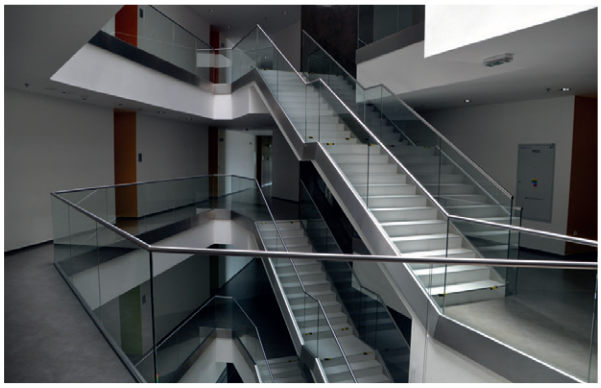

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CONTENT / OBSAH

EDITORIAL

Dear Readers,

The journal Zdravotníctvo a sociálna práca (*Health and Social Work*) was established in 2006 at Faculty of Health and Social Work of blessed P.P. Gojdič in Prešov, St. Elizabeth University College of Health and Social Work in Bratislava. In 2019, the 14th year of the journal was published.

Previously professional journal, within 5 years developed into an international, peer-reviewed scholarly journal, published quarterly (4 issues per year). The journal is published by the St. Elizabeth University of Health and Social Work in Bratislava. The journal became international in 2009. The journal is published and distributed in the Slovak Republic and also in the Czech republic.

Since 2011, the journal is published both in print and as electronic issues, available from: www.zdravotnictvoasocialnapraca.sk and www.zdravotnictviasocialniprace.cz. Starting by issue No. 3 in 2014, the scope of the journal has broaden and the journal is covering health sciences, such as Public Health, Nursing, Laboratory Medicine, but also helping professions such as Social Work or Pedagogy. Collaboration with Faculty of Health and Social Work of Trnava University in Trnava was initiated.
The journal is indexed in the following databases: Central and Eastern European Online Library – CEEOL (since 2018), Bibliographia Medica Slovaca (BMS), and Slovak reference database CiBaMed.

The part of journal is Supplementum, to publish abstracts from international conferences organized by the St. Elizabeth University of Health and Social Work in Bratislava. In 2020, the conference was planned, similarly to last year, in Ustroń, Poland. In the event of a persistent adverse epidemiological situation due to the Corona virus pandemic, the conference will be held as an online conference.

Our long-term effort is to gradually acquire for the journal Central European significance and be included in international databases. The editors are aspiring for registration in other relevant international databases, the journal is moving this year from issue 3 to the publication of articles in English only. Starting by issue No. 4 in 2016, the journal accepted the Harvard style of referencing, and changed guidelines for the authors. The aim of the changes was to move closer to the standard in international journals published in English in the area of health and helping professions. The journal will be renamed next year.

Prof. Miron Šramka, MD, DSc.
Editor in Chief

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RISK ACTIVITIES OF CHILDREN DURING THE PANDEMIC AND SUMMER HOLIDAYS

RIZIKOVÉ AKTIVITY DETÍ POČAS PANDÉMIE A LETNÝCH PRÁZDNIN

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ABSTRACT

Introduction: In this paper, the authors present the riskiest activities of children during the school holidays and the current global pandemic. Using examples from different countries on children's injuries, they point out the most common aetiology of injuries in households, outdoor and indoor.

Objective: The goal of the paper is to emphasise the prevention of serious injuries in individual activities. Prevention can reduce the number and severity of injuries to children.

Findings: Children's risky activities are the source of many observations, evaluated by paediatric injury specialists from all around the world. Statistical evaluation of injuries provides the possibility of an active approach in injury prevention.

Conclusions: Preventive measures during the school holidays and currently during the pandemic will help reduce the number of injuries, their severity. Sports and recreational activities will thus lead to their primary goal, to provide rest, entertainment and relaxation for our "children" during the supervision of their parents, grandparents, instructors, carers and, mainly out-of-supervision activities.

Keywords: Holidays, pandemic, injuries, children

ABSTRAKT

Úvod: Autori vo svojom príspevku predstavujú najrizikovejšie aktivity detí počas školských prázdnin a súčasnej celosvetovej pandémie. Na príkladoch štatistík z rôznych krajín o úrazoch detí upozorňujú na najčastejšiu etiológiu úrazov v domácnostiach, vonkajších a vnútorných priestoroch.

Cieľ: Cieľom práce je pri jednotlivých aktivitách zdôrazniť prevenciu vzniku závažných úrazov. Prevenciou je možné dosiahnuť zníženie počtu a aj závažnosť poranení detí.

Zistenia: Rizikové aktivity detí sú zdrojom mnohých sledovaní, vyhodnocovaní špecialistami na pediatrické úrazy z celého sveta. Štatistické vyhodnocovanie úrazov poskytuje možnosť aktívneho prístupu v prevencii úrazov.

Závery: Preventívne opatrenia počas školských prázdnin a v súčasnosti počas pandémie pomôžu znížiť počet úrazov, ich závažnosť. Športové a rekreačné aktivity tak povedú k svojmu primárnemu cieľu, poskytnúť oddych, zábavu a relax našich „ratolestí" počas dozoru svojich rodičov, starých rodičov, učiteľov, vychovávateľov a opatrovateľov a hlavne aktivít mimo dozoru.

Kľúčové slová: Prázdniny, pandémia, úrazy, deti

INTRODUCTION

Summer holidays are one of the most anticipated periods of the year for children. Nice weather, no school duties, lack of parental supervision presuppose two months of carefree alternation of lazing, active sports and inventing new adrenaline activities. The current global pandemic situation extends this period. The impossibility of otherwise frequent collective spending of leisure time, mass organised sports and relaxation increases the demands of all children (perhaps most) for individual time spent near the house, on private land, swimming pools and, of course, at home. Supervision, surveillance by an adult is not always possible, so it is necessary to draw attention to some activities that can radically change this ideal state of rest and relaxation. Work on injuries during summer holidays from Sweden and the United Kingdom found that up to 80% of fractures in children and adolescents are after injuries in summer months (Hedstrom *et al.* 2010, Lyons *et al.* 1999). The evaluation of Spanish authors presents the highest incidence of children's injuries in traffic injuries in summer months (Monmany *et al.* 2011). The work of authors from the countries exotic to us, such as Israel and Iran, also noted an increased number of visits and treatments in trauma and orthopaedic clinics in July and August (Gofina *et al.* 2015, Naeini *et al.* 2015). The latest statistical work by Norwegian authors on childhood fractures states the highest incidence of fractures during summer months. Fractures occur mainly during outdoor activities when the sunshine period is longer (Randsborg *et al.* 2020). In view of these facts, a number of works were presented on how to prevent from "summer holiday injuries" (Eisner *et al.* 2014, Foster *et al.* 2014). The presentation of children's risky activities during summer holidays should improve awareness of possible risks and thus, in cooperation with all involved parties, minimise the risk and severity of possible injuries.

TRAMPOLINE

The trampoline as a source of entertainment has also spread in our country after the "pilgrimage" through North America and Western Europe (Figure 1 and 2). Around 100,000 children are injured annually in the United States, an average of 30 per 100,000 children (Briskin *et al.* 2012). A 6-year study from Bern, Switzerland, evaluated 286 children with an average age of 7 years with a trampoline injury (Klimek *et al.* 2013). Multiple authors found that the presence of more than one person during the game on the trampoline, age up to 6 years, entering and leaving the trampoline, attempts at acrobatics are the most risky activity (Rao *et al.* 2019, Briskin *et al.* 2012, Klimek *et al.* 2013, Loder *et al.* 2014, Barr, 2014). According to the latest observations, the proportion of injuries in trampoline parks and injuries on private trampolines is 66% compared to 34% in parks (Doty *et al.* 2019). In general, there is a presumption of an increased incidence of injuries on private trampolines due to the ban on gathering, mass sports activities during the pandemic. According to different authors, the location of the injury is different. The fractures of the upper limb predominate (Loder *et al.* 2014), according to other statistics, the fracture of ankle skeleton (Briskin *et al.* 2012). The increased incidence of supracondylar fractures of the humerus during summer holidays was also evaluated by the work of British doctors. The authors of the study state that up to 50% of fractures were after the activity on a trampoline (Barr 2014).

Prevention

The prevention of injuries to children during trampoline activity is linked to several factors. Several authors dealing with this issue consider the most important to limit activity on "home trampolines" (difficult to achieve during the pandemic – quarantine), to avoid the presence of more than one person on the trampoline and to ban trampoline activity for children under 6 (Briskin *et al.* 2012, Klimek *et al.* 2013, Loder *et al.* 2014, Rao *et al.* 2019, Kubašovský *et al.* 2020). All acrobatic activities require special supervision, acrobatic handsprings and hyperflective exercises may cause injury to the cervical spine, resulting in a neurological impairment (Rao *et al.* 2019, Simth *et al.* 2019). The presence of an adult is required for any activity on the trampoline. The presentation of information about injuries on the trampoline is also one of the forms of prevention. In Switzerland, the Injury Prevention Society has issued a publication for parents entitled "Safety Recommendations for Trampoline

Activity" with 16 chapters on how to reduce the risk of injury during trampoline activity (Klimek *et al.* 2013). Contributions on this issue should be published not only in the literature but also in the media accessible to the general public (Briskin *et al.* 2012).

Figure 1. Trampoline activity
(Source V. Janušková).

Figure 2. Trampoline activity
(Source V. Janušková)

BICYCLE, TRICYCLE, SCOOTER, ROLLER SKATES

Self-propelled vehicles are very popular activities for children even during summer holidays. In Sweden, bicycle injuries in summer months account for up to 60% of children's road injuries (Hedstrom *et al.* 2010). The authors from the United Kingdom evaluated the incidence of fractures in children and found that bicycle injuries were the cause of fractures in 63% of cases (Lyons *et al.*1999). The work from the USA registers 994 children with bicycle injuries treated at the Accident Centre in 10 years, with the highest frequency in summer months (Brown *et al.* 2002).

Prevention

It is necessary to use a helmet and knee and elbow pads, while riding a bike and when roller-skating. The helmet reduces the risk of head injury by up to 85% (Eisner *et al.* 2014). It is important to prevent falling from a tricycle or scooter into the pool, for example. Attention is drawn to the ban on the use of tricycles or scooters near roads and transport, of course, a constant adult supervision is a commonplace. It is necessary to ban the presence of more than one person on a bicycle, a ban on children riding a bicycle at night (Eisner *et al.* 2014).

POOLS AND CHILDREN'S POOLS

Bathing, swimming (Figure 3), various competitive games in the water are, of course, an important activity of children during summer holidays. Supervision should be provided at public swimming pools – it is determined how many lifeguards should ensure a safe stay at the swimming pools, depending on the number of pools. Drowning is the second most common cause of unintentional injuries resulting in deaths among children and youth in the EU. Slovakia is in the 19th place among the 27 evaluated EU countries with an average of 1.45/100,000 (EU average 1.8/100,000) (Analysis of the state of injury rate and safety of children and youth in the Slovak Republic, 2014). Home swimming pools, the number of which is growing every year, represent a high-risk area of children's activity. Statistics from the USA state that 5,000 children under the age of 15 are examined annually after injuries associated with an activity in swimming pools in emergency clinics. The number of drownings per year is more tragic, with an average of 390 children under the age of 15 (Eisner *et al.* 2014). A small children's pool is also a risky place for small children. It is stated that small children can drown in water smaller than 5cm. In the period 2006–2010, 434 children under the age of 5 drowned in the USA (Eisner *et al.* 2014). However, the greatest risk is posed by open water areas and especially flowing watercourses. Jumps into shallow water, often ending in injuries of the cervical spine and subsequent quadriplegia, are also risky (Mašán 2019).

Prevention

Prevention emphasises the constant presence of an adult, securing the surroundings of the pool and thus

preventing accidental falls into the pool (Eisner *et al.* 2014). Pool fencing reduces the likelihood of injury (Yang *et al.* 2007). During the stay in the pool, it is also dangerous to play with inflatable fun objects – rings, inflatables, which make it impossible to supervise the child and block the inspection in the event of difficulties. Swimming skills and swimming training are also an important factor (Eisner *et al.* 2014). Some authors also mention educational programmes for parents about first aid in drowning prevention (Yang *et al.* 2007). It is recommended never to leave a children's pool filled with water in the garden or in any other place around the house. All pools, containers and other vessels must be poured out and turned upside down so that they would not be filled for example, with rainwater (Eisner *et al.* 2014).

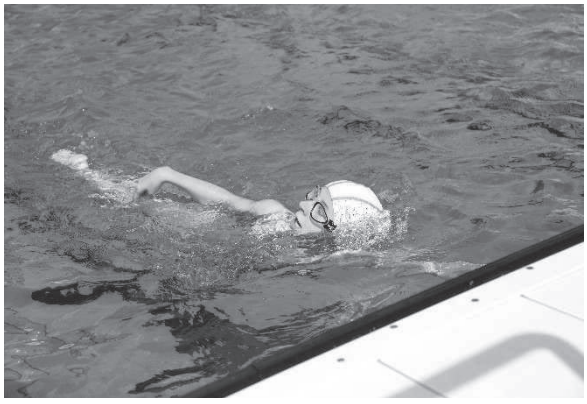

Figure 3. Swimming
(Source: Photo V. Janušková)

HOUSEHOLD

In the absence of parents during holidays, the very stay in an otherwise safe household is a risky place for children, especially at a younger age. Falls are the third most common cause of death in children in the EU and Slovakia, but the most common cause of hospitalisation. In less developed countries, the risk of death after a fall is 9 times higher than in developed countries. Slovakia is in 20th place among the 27 evaluated EU countries with a value of 0.57/100,000 for boys (EU average 0.53) and 0.32/100,000 for girls (EU average 0.21) (Analysis of the state of injury rate and safety children and youth in the Slovak Republic, 2014). Statistically, a fall at home is the cause in 25–50% of medically treated children. For children aged 1–3 years, falls from stairs, windows and furniture are most often described, and for older children, falls from balconies, ladders and roofs are reported (McDonald *et al.* 2010). The authors from the United Kingdom quote a fall in the living room, a fall in the garden and on the stairs as the most common cause of fractures in children at home (Lyons *et al.* 1999).

Prevention

The technical security of the household, flat is the prevention of health-threatening falls in the absence of parents at home. Thorough and safe fixing of furniture, security locks of windows, balconies, ensuring the impossibility of access to ladders, to openings on the roofs are a prevention of sometimes tragic events (McDonald *et al.* 2010).

YARD AND GARDEN

The space around the house, yard, garden represent, similarly to the household, risky locations in the absence of parents (Figure 4 and 5). The use of a lawn mower, children's attempts at independent activities with other technical “helpers” in caring for the garden, around the house is a significant risk. Examples are high-pressure cleaners, various wood shredders. Currently popular barbecue is a significant risk factor in the garden.

Prevention.

Ensuring the impossibility of contact with risky areas and adequate supervision, surveillance may minimise risk. The age limit for working with an electric lawnmower is 16 years, mechanical 12 years (Foster, Groebe 2014).

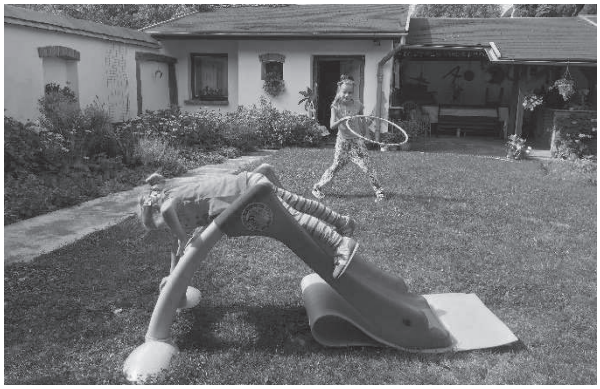

Figure 4. Activities in Yard
(Source: Photo V. Janušková)

Figure 5. Activities in Garden
(Source: Photo V. Janušková)

CONTACT WITH PETS, DOGS

Safe contact with pets is a year-round problem. Available statistics inform mainly about contacts with dogs (Figure 6 and 7), while in our country the number of domestic dogs in family houses, but also in housing estates is increasing significantly. According to reports from the daily press, there are more than 400,000 dogs in Slovakia, about 10,000 dogs are born annually with a pedigree (Kubašovský *et al.* 2016).

In neighbouring Austria, the incidence of dog bites in children aged 0 to 16 years is 1 bite injury per 1,000 children per year. 50% of the total number is in boys aged 5 to 9 years, in whom the frequency is up to 6 cases per 1,000 children per year (Schalamon *et al.* 2006). In 2015 statistics from the United Kingdom, the share of children and minors under 16 is 44% of the total number of bites. In the observed group, the incidence of unknown, dogs of another was 54.7% (Westgarth *et al.* 2018). The increase in injury rate in contact with one's own, neighbour's and, worst, unknown dog in the summer months is caused by several factors (Sabhaney *et al.* 2012).

One of them is high outdoor temperatures and possible overheating of the dog's body, lack of fluids and insufficient education of the dog, non-compliance with the prescribed rules – lead, muzzle. The absence of adults and the possibility of playing with a "pet" which adults would not otherwise allow is another negative factor. Injuries by "own" dogs are the majority of injuries to children by dogs, more than 50% when trying to separate two "beating" dogs (Kubašovský *et al.* 2016). In young children under 12 years of age, the head, face and neck are the most often injured body part (Sabhaney *et al.* 2012, Katica *et al.* 2019).

According to Australian follow-up, 51% of bite wounds in children are located on the head and face (Ozzane-Smith *et al.* 2001). The first aid and treatment of wounds after a dog bite requires knowledge and experience, permanent consequences may not be ruled out even after appropriate treatment (Kubašovský *et al.* 2016).

Prevention

Prevention of this type of injury is based on educating children about the method of contact with a dog, prohibiting contact of young children with a dog without the presence of an adult, strict prohibition of contact with a dog of another. The authors dealing with this issue also emphasise the need for "socialisation" of dogs and thus the suppression of aggression (Ozzane-Smith *et al.* 2001, Kubašovský *et al.* 2016).

Figure 6. Contact with dog
(Source: Photo V. Janušková)

Figure 7. Contact with dog
(Source: Photo V. Janušková)

FIREARMS – THE HIGHEST RISK FOR CHILDREN

The ownership (possession) of firearms by parents, relatives, neighbours is the last, but the most important

area of possible risk for children (Figuure 8 and 9). 5,790 children are treated annually in the United States after gunshot wounds and nearly 1,300 children die (Fowler *et al.* 2017). For the period 2003–2012, the authors from the USA evaluated 2,847 gunshot wounds to the head in children and youth with an average age of 14.8 years with a mortality of 45.1% (Deng *et al.* 2019). Statistically, out of the total number, 64% are accidental gunshot wounds (Srinivasan *et al.* 2014). Statistics show that accidental gunshot wounds to children most often occur in the afternoon after arriving from school and in the absence of parents who are still at work. The situation is similar during holidays. The absence of parents, curiosity of children and insufficient securing of firearms can lead to tragic consequences (Butkus *et al.* 2014).

Prevention

The American Paediatric Society emphasises these preventive measures at the end of the resolution on children's gunshot wounds. The absence of weapons in flats, houses with children is the most reliable prevention. Safe storage, locking of weapons with separate, secure storage of ammunition is the obligation. In prevention, they emphasise parents' medical or psychological consulting, which is usually effective, while consulting programmes aimed at children are ineffective (Dowd *et al.* 2012; Butkus *et al.* 2014). Prevention requires compliance with the rules by holders of firearms licences, sufficient weapons security. The ban on the handling of children with weapons even during the presence of an adult is significant (Butkus *et al.* 2014).

Figure 8. Firearms (Source: Photo V. Janušková)

Figure 9. Firearms. (Source: Photo V. Janušková)

CONCLUSION

The authors were focusing the risky activities of children during the summer holidays and currently also during the pandemic, quarantine measures. They pointed out statistics on children's injuries, presenting prevention options to reduce the risk of injuries during these activities. Supervision, surveillance of children during the holidays must be increased compared to "everyday" supervision. An increase in interest in the risks of individual activities, the application of some recommendations for the carefree and safe survival of the pandemic and summer holidays should be the result of the presentation.

Conflict of Interst

No Conflict of Interest.

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USE OF 3D IMOOVE STIMULATION IN HEMIPARETIC PATIENTS WITH LOWER LIMB INSTABILITY

VYUŽITIE 3D STIMULÁCIE IMOOVE U HEMIPARETICKÝCH PACIENTOV S INSTABILITOU DOLNEJ KONČATINY

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ABSTRACT

Introduction: Use of 3D Imo stimulation in hemiparetic patients with lower limb instability. We dealt with the issue in which we specify stroke with a narrower focus on ischemic stroke, the main causes of its occurrence but also the complications associated with it.

Objective: The aim of the work was to investigate the effects of exercise on a special balance platform Imoove mini in hemiparetic patients affected by ischemic stroke in the basin and. cerebri media in which lower limb instability has been demonstrated.

Methodology: The partial objectives include the evaluation of the change in the load of the paretic lower limb in twenty tested patients using the ALFA stabilometric platform and the assessment of dynamic balance using the Timed Up and Go test.

Results: Evaluation of performed tests and assessment of statistical significance. The results of the clinical study suggest an improvement in the dynamic stability of the test kit, an improvement in the mean load of the paretic lower limb and an increase in the dominant load in patients with right-sided hemiparesis. The results of the research do not confirm such an improvement in patients with left-sided lower limb paresis as in patients with right-sided paresis.

Conclusion: Based on the results of a clinical study, we concluded that the exercise unit using Imoove has positive effects on increasing the load of the paretic lower limb in patients after overcoming ischemic CMP in the chronic stage of the disease. The proof is the reduction of the time interface in the final testing of the TUG test and thus the increase of the dynamic balance of the examined patients.

Key words: hemiparesis, 3D Imoove stimulation, instability, dynamic balance, physiotherapy.

ABSTRAKT

Úvod: Využitie 3D Imoove stimulácie u hemiparetických pacientov s instabilitou dolnej končatiny. Zaoberali sme sa problematikou, v ktorej špecifikujeme cievne mozgové príhody s užším zameraním na ischemické cievne mozgové príhody, hlavné príčiny jej vzniku ale i komplikácie s ňou spojené.

Cieľ: Cieľom práce bolo preskúmať účinky cvičenia na špeciálnej balančnej plošine Imoove mini u hemiparetických pacientov postihnutých ischemickou cievnou mozgovou príhodou v povodí a. cerebri media, u ktorých sa preukázala instabilita dolnej končatiny.

Metodika: Medzi čiastkové ciele patrí vyhodnotenie zmeny zaťaženia paretickej dolnej končatiny u dvadsiatich testovaných pacientov prostredníctvom stabilometrickej plošiny ALFA a posúdenie dynamickej rovnováhy pomocou Timed Up and Go testu.

Výsledky: Vyhodnotenie vykonaných testov a posúdenie štatistickej významnosti. Výsledky klinickej štúdie poukazujú na zlepšenie dynamickej stability testovacieho súboru, zlepšenie priemerného zaťaženia paretickej dolnej končatiny a u pacientov s pravostrannou hemiparézou zvýšenie dominantného zaťaženia. Výsledky výskumu nepotvrdzujú u pacientov s ľavostrannou parézou dolnej končatiny až také zlepšenie ako u pacientov pravostrannou parézou.
Záver: Na základe výsledkov klinickej štúdie sme dospeli k záveru, že cvičebná jednotka s využitím Imoove má pozitívne účinky na zvýšenie zaťaženia paretickej dolnej končatiny u pacientov po prekonaní ischemickej CMP v chronickom štádiu ochorenia. Dôkazom je zníženie časového rozhrania pri výstupnom testovaní TUG testu, a tým zvýšenia dynamickej rovnováhy vyšetrovaných pacientov.

Kľúčové slová: hemiparéza. 3D Imoove stimulácia. Instabilita. dynamická rovnováha. fyzioterapia.

INTRODUCTION

Stroke (ictus, CMP) is one of the most common brain diseases. It can currently be considered one of the leading causes of morbidity and mortality worldwide. Due to the complexity of the human brain and the structural changes that CMP causes, it is also the cause of multiple disabilities (Biró *et al.* 2018). Our vision is to expand the possibilities of rehabilitation and bring new knowledge about advanced techniques in favor of the restoration of affected muscle functions (Bartolčičová *et.al.* 2019). The main cause is the increasingly frequent occurrence of CMP in younger age groups, a lifestyle that adversely affects physical activity and mental balance of individuals (Gúth 2019).

The rehabilitation process should definitely start as soon as possible after the onset of the stroke. The intensity of the rehabilitation process depends on the patient's condition and the degree of his disability. The aim of such rehabilitation is to achieve a degree of functional independence.

The most common disorders that occur in patients after CMP are:
• sensory disturbances
• disorders of symbolic functions
• cognitive impairment
• limb movement disorders (central paresis)
• involvement of the cranial nerves (especially paresis of the oculomotor nerves, paresis of the facial nerve, etc.)
• surface, deep sensitivity disorders
• vestibular and cerebellar disorders

All the above disorders must be targeted within a comprehensive rehabilitation program. When compiling the rehabilitation plan, we use the evaluation of postural tone, postural and movement patterns and functional abilities (Kolář *et al.* 2012).

We use joint approximation, tapping, facilitation methodologies, active assisted movement, posture training and active movement to support reflex postural mechanisms. To prepare for patient mobilization, we start by training the so-called bridging, which activates and trains the hip and torso extensors. They are an integral part of achieving a balanced seat and other verticalization procedures. One of the many advantages of bridging is the mobilization of the pelvis, which is a condition for rhythmic walking. Bridging is also an effective prevention of unwanted fixation of plantar flexion of the lower limbs and allows training of even weight transfer to both limbs. In order to influence the patient's motivation, it is necessary to train movements that can be used in everyday activities (change of position on the bed). Without rotation, no controlled movement is possible and therefore the exercise also includes overturning (pelvis rotation). It finds its application in managing stable walking.

Chronic Stage

The stabilization of erroneous postural and movement stereotypes presents a frequent picture of the chronic stage. The patient uses the paretic lower limb primarily as a rigid support and uses the majority support with a healthy hand for a prosthetic device (walking stick, barrel. For patients in the chronic stage who do not have developed movements on the affected

side, it is more appropriate to perform methodical exercises from the very beginning. If we are not even able to temporarily inhibit the spasticity of the affected limb, we prefer occupational therapy, in which we strive to improve the patient's self-care and practice normal daily activities.

Postural Stability

By this term we mean the active holding of body segments against the action of external forces. Taking a specific position against gravity for a certain time is the main task of motor skills. The posture is secured by internal forces and a key role is played by muscle activity controlled by the central nervous system (Vařeka, Vařeková 2009).

The concept of stability is closely related to postural. In the area of the locomotor system, we perceive stability as a state of the body in which the joint structures are the least stressed and the muscles work in the best possible cooperation. The movement is thus performed most economically. The ability to ensure such a posture so that an unintended or uncontrolled fall does not occur is called postural stability (Kolář 2012).

Postural Control

The main task is to keep the body upright. This is essential in carrying out normal daily activities, such as walking or manipulating objects (Mansfield 2011).

Main control mechanisms:
• feedback, detects instability
• forecasting (feedforward)

Subsequently, these mechanisms are supplemented by corresponding motor programs, the task of which is to coordinate muscle activity in relation to other forces of action (Kao 2014). The choice of an appropriate postural mechanism depends on the quality of the support and the corresponding sensory information (Shumway-Cook, Woollacott 2012).

Stability disorders due to hemiparesis in patients after CMP are strongly affected by deficits in the following areas:

- motor control
- somatic perception
- muscle strength, tone
- active and passive mobility
- balanceSpecific imbalances are very common in these patients.

It causes their involvement of individual components - movement strategies, cognitive and biomechanical processing or sensory modality. These components are part of postural control. Some patients after CMP at first are not able to stand at all, others have a significant asymmetric weight distribution or impaired weight transfer. As a result of imbalances, up to 73% of patients fall within the first six months of stroke. Falls subsequently cause other complications such as. fractures. Balance disorders limit the patient's independence and locomotor abilities and thus significantly affect the activities of everyday life.

OBJECTIVE OF THE WORK

The main objective was to investigate the effects of exercise on the special Imoove mini balance platform in hemiparetic patients with ischemic stroke in the basin and cerebri media in which lower limb instability has been demonstrated. Due to the small size of the Imoove mini (Conrad 2018), it is easy to install in any physiotherapy practice (see this device in Figure 1).

Figure 1: Detailed description of the Imoove mini (source: http://imoove.cz/)

We formulated following research goals for the Imoove mini device:

1. Find out whether the average load on the paretic lower limb will change after completing the exercise unit performed on the Imoove mini.

2. Find out whether the dominant load of the paretic lower limb will change after completing the exercise unit implemented on the Imoove mini device.

In this work, we focused on the results of examining three hypotheses:

H1: Due to the exercise unit implemented on the Imoove mini, the dominant load of the paretic lower limb will increase.

H2: Due to the exercise unit implemented on the Imoove mini, the time interface in the Timed Up and Go test will be reduced.

Methodology of work and characteristics of the research group

A total of 20 patients with a clearly diagnosed MKCH were included in the test group - Stroke, chronic condition of patients and both men and women in the age range of 45-70 years were involved. Before and after the therapy, we performed selected testing (using the ALFA stabilometric platform and the Timed Up and Go test). In the proportion of affected parties, 10 right-sided and 10 left-sided were included in the study. Eleven patients had a dominant lower limb involvement. The clinical study took place in the period from September 2019 to January 2020 in a private neurorehabilitation facility in the Czech Republic. They did not receive any other rehabilitation treatment during the study.

For the objectivity of the study results, we used the following tests:

1. Stabilometric test (Load distribution test)
2. Timed Up and Go test (TUG test)

1 Stabilometric test - load distribution test

The aim of the stabilometric test is to assess and subsequently evaluate the average and dominant load of both the right and left side of the patient's lower limb. To examine the real condition, it is necessary to select the option "hide patient monitor" (see this device in Figure 2). After the test, the following information is displayed here:

- time (30 seconds)
- average load of the left side in%
- average load of the right side in%
- time of dominant load of the left side in%
- time of dominant load of the right side in%

Figure 2: Detailed description of the ALFA stabilometric platform
(source: https://www.fysiomed.cz/)

2 Timed Up and Go test

The Timed Up and Go test is a simple test used to determine and examine functional mobility and the risk of falls. The test requires the sitting patient to get up from the chair, walk three meters, turn around, and return to the chair and sit on it again. The time it takes for a patient to complete this task is measured by a physiotherapist.

The course of therapy

Selected patients were introduced the Imoove mini platform on which the therapy was taking place. The 25-minute exercise unit was performed in the same wayfor all patients, three times a week for one month. The goal of the variability of the elispheric movement is to relax the joint structures and at the same time strengthen the muscle chains in their natural spirals. Through 3D movement, the Imoove engages approximately four hundred muscles at a time, meaning that it allows you to perform intense training in minimal

time. The motorized drive plate creates a special three-dimensional movement. The unique motion technology supplies the human body with impulses in three planes through centrifugal force. This force trains the body in its natural (spiral) motion. The result of such an action is based on the fact that the Imoove restores strength, complexity of movement and works on the basic posture.

Table 1. Description of the exercise unit during the fourth week

Description of the exercise	*Foot storage*	*Ampli-tude*	*Speed*
Stand straddling	PDK: C, A LDK: D, B	5	5
A healthy limb step	PDK: C, A LDK: D (heel)	4	5
Step with a paretic limb	PDK: D, B LDK: C (heel)	4	4
Targeted weight transfer to the paretic limb	PDK: C, A LDK: D, B	3	4
Squat endurance	PDK: C, A LDK: D, B	3	3

(Source: own processing)

The measured values show that the speed and amplitude increased during the individual weeks. The values were chosen so that the exercise unit was manageable for patients and at the same time shifted their achieved goals.

Processing of obtained data

We performed the statistical analysis using the computer program Microsoft Excel based on a two-sample paired T-test and a comparison of input and output data. We created tables and graphs dealing with the obtained results in Microsoft Excel and Word.

THE RESULTS

1. **Stabilometric ALFA test (Load distribution test)**

Right paresis of the lower limb

Seven patients experienced an improvement loading in right lower limb, no change in 2 patients and a slight 1% worsening in 1 patient. The following table shows the mean value with deviation for these patients (Tab. 2).

Table 2. Results of input and output values for ALFA test, R – Right side, L – Left side

Paretic right limb			
	Average weight in %		
	Input R	Output R	Difference
Average	45,1	47,2	2,1
Deviation	11,9	8,5	3,4
	Time load in %		
	Input L	Output L	Difference
Average	60,7	57,3	3,4
Deviation	22,9	17,6	5,4

(Source: own processing)

Left paresis of the lower limb

An improvement in left lower limb was seen in 7 out of 10 patients. A worsening after rehabilitation was seen for 1 patient and 2 patients the final values were not changed. The following table shows the mean value with deviation for these patients (Table 3).

Table 3. Results of input and output values for ALFA test, L – Left side, R – Right side

Paretic left limb			
	Average weight in %		
	Input L	Output L	Difference
Average	45,6	47,8	2,2
Deviation	15,0	10,5	4,5
	Time load in %		
	Input R	Output R	Difference
Average	59,8	56,9	2,9
Deviation	34,2	24,6	9,6

(Source: own processing)

2. Timed Up and Go test (TUG test)

The values of the TUG test results are given in seconds to one decimal place. In all tested patients there was a decrease in the time interface at the final examination of the TUG test, by an average of 2,4 s (see Tab. 4).

Table 4. Results of input and output values of TUG test in seconds

	TUG test Initial exam	TUG test Output exam	Differences
Average	30,82	28,45	2,4
Deviatio	2,04	1,87	0,75
Median	31	28,5	2,2

(Source: own processing)

DISCUSSION

We dealt with the issue of ischemic strokes, subsequent rehabilitation and the instability of the lower limb due to hemiparesis.

Asymmetric lower limb loading in patients after CMP is a common occurrence in practice. This uneven distribution of the center of gravity and work with it has an impact on the overall position of the torso and posture, reduces mobility and independence. Based on a clinical study involving 20 patients diagnosed with ischemic stroke, the Imoove mini can be described as an effective means of improving overall balance and thus increasing the load on the paretic lower limb in patients after CMP.

The ALFA balance platform and TUG test was used for objective clinical testing, allows the use of "games" based on virtual reality, which can affect the balance of patients after CMP. The results of our research provide an evaluation that the rehabilitation of patients after CMP in a chronic state using unstable platforms leads to a positive effect on their current condition. During the final test on the ALFA stabilometric platform, the tested patients improved the average load on the paretic limb (this occurred in both right-sided and left-sided paresis). The team clearly confirms our hypotheses. Virtual reality and the use of video games are becoming an increasing trend in the treatment of neurological patients.

CONCLUSION

Based on the results of this clinical study, we concluded that the exercise unit using Imoove mini has positive effects on increasing the load of the paretic lower limb in patients after overcoming ischemic CMP in the chronic stage of the disease. The proof is the reduction of the time interface in the final testing of the TUG test and thus the increase of the dynamic balance of the examined patients. Examination using the ALFA stabilometric platform evaluated the exact percentage load on the lower limbs, based on which the following evaluation was made: the average load on the paretic lower limb. The tested patients achieved an improvement in both dynamic balance (as evidenced by the statistically confirmed significance of the TUG test) and static balance (as discussed in the statistically significant results of testing on the ALFA stabilometric platform).

In conclusion, individual training of patients after CMP using Imoove mini can be a suitable complementary method to improve balance and increase the symmetrical load on the lower limbs, which can subsequently have a positive effect on reducing the risk of falls and improving the life of such patients.

RECOMMENDATIONS FOR PRACTICE

Given the results of our clinical study, we recommend the following measures for practice:

- increasing the use of unstable platforms in the home environment of patients, possibly
- the use of sensory and proprioceptive elements in order to increase the patient's motivation for the targeted action of proprioception on the paretic limb
- the use of virtual reality as a means of increased motivation for all age groups affected by stroke.

Conflict of Interest
No conflict of interest

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OCULAR ADVERSE EFFECTS OF SYSTEMIC RETINOID THERAPY
NEŽIADUCE ÚČINKY LIEČBY SYTÉMOVÝMI RETINOIDMI NA OKO

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ABSTRACT

Introduction: Systemic retinoids are exceptionally effective drugs widely used in dermatology. In spite of their great effectiveness, these drugs have a relatively unfavorable profile of adverse effects. Good interdisciplinary informedness is a crucial requirement for the utilization of maximal therapeutic effect and a useful tool for reducing risks of potential harm to patients.

Research objectives: The aim of this article is to provide a comprehensive review of currently available scientific information on systemic retinoid therapy with respect to ocular adverse effects.

Core of Work: Ocular adverse effects of isotretinoin include: atrophy of meibomian glands, blepharoconjunctivitis, impaired dark adaptation, myopia, corneal opacities, and teratogenic abnormalities of the eye

Conclusion: Despite the significant prevalence of some of the above-mentioned adverse effects, there is very limited scientific evidence describing the underlying mechanisms, clinical presentation, course and their potential reversibility. The article summarizes currently available information on this topic.

Keywords: Retinoids, isotretinoin, meibomian glands, eye

ABSTRAKT

Úvod: Systémové retinoidy sú výnimočne účinné liečivá široko využívané v dermatológií. Napriek ich výbornej efektivite majú relatívne nepriaznivý profil nežiaducich účinkov. Dobrá interdisciplinárna informovanosť je základným predpokladom pre využitie ich maximálneho terapeutického potenciálu za súčasnej minimalizácie rizika ohrozenia zdravia pacienta

Cieľ: Cielom článku je sprostredkovať ucelený prehľad súčasne dostupných informácií o systémovej liečbe retinoidmi so zreteľom na nežiaduce účinky postihujúce oči.

Jadro práce: Medzi očné nežiaduce účinky patrí abnormálna sekrécia a atrofia meibomových žliaz, blefarokonjuktivitída, porucha adaptácie na tmu, myopia, korneálne opacity a teratogénne abnormality oka.

Záver: Napriek významnej prevalencií niektorých z vyššie spomentých nežiaducich účinkov, existujú len veľmi limitované vedecké dôkazy popisujúce mechanizmus ich vzniku, ich klinický obraz, priebeh a prípadnú reverzibilitu. V článku sú sprehľadnené v súčasnosti dostupné informácie o danej problematike.

Kľúčové slová: Retinoidy, izotretinoín, meibomove žľazy, oko

INTRODUCTION

Orally administered retinoids are synthetic derivatives of vitamin A. This group of drugs is highly effective in the treatment of a wide range of skin diseases. Most important indications of isotretinoin are

severe forms of acne vulgaris. The prevalence of acne vulgaris in the age groups between 12 and 25 years is 85% (Zaenglein 2019). The widespread prevalence of the disease and its significant impact on the quality of life account for the broad use of isotretinoin in clinical setting. Despite its exceptional efficiency, it is always crucial to individually and carefully evaluate the risk to benefit ratio due to the unfavorable profile of adverse effects of systemic retinoids.

An appropriate level of interdisciplinary informedness enables for the utilization of maximal therapeutic potential while also minimizing the risk of harm to a patient.

RESEARCH OBJECTIVES

The aim of this work is to provide a comprehensive review of the current scientific evidence available on systemic retinoid therapy with regard to its ocular adverse effects. In clinical setting, these can often be overlooked even though they have a high prevalence and cause significant discomfort.

CORE OF WORK

A brief summary of systemic retinoids

Retinoid is a collective title of synthetic and natural derivatives of vitamin A. Vitamin A is considered a key component of multiple physiological processes in the skin and in the eye and its deficiency causes several dermatological and visual disorders.

The first generation of systemic retinoids was introduced in the 1940s with tretinoin being the first retinoid commercially available. Due to its adverse effects, its use in the treatment of dermatological conditions was later discontinued.

Isotretinoin is another first-generation retinoid which still plays an irreplaceable role mainly in the treatment of severe forms of acne vulgaris. As acne vulgaris is a disease with an almost universal prevalence in certain age groups, isotretinoin is the most widely used systemic retinoid.

Second-generation systemic retinoids include acitretin and etretinate, which are used mainly in the treatment of severe forms of psoriasis (erythrodermal psoriasis, pustular psoriasis) and keratinization disorders (congenital ichthyosis, pityriasis rubra pilaris, Darier's disease).

The third generation of systemic retinoids are bexarotene and alitretinoin. These are extremely potent, but at the expense of even greater toxicity compared to the previous generations. It is their high toxicity that is the reason for their narrower indication range. They are used mainly in the therapy of oncological diseases (Aryal, Upreti 2017).

Mechanism of action of systemic retinoids

The following text will focus mainly on the most widely used systemic retinoid isotretinoin, as its effects on the eye are the ones best described. The mechanism of action of isotretinoin has not been fully elucidated. There is limited experimental and clinical evidence that has led to the formulation of several hypotheses explaining the unique therapeutic effect as well as the development of its side effects. Probably the most important mechanism mediating the therapeutic effect of isotretinoin is the induction of apoptosis.

It should be noted that programmed cell death is an essential component in the process of holocrine secretion of sebum as well as of terminal differentiation of keratinocytes. Homeostasis of the skin and the pilosebaceous unit is thus critically dependent on apoptosis (Costanzo *et al.* 2015).

Isotretinoin induces apoptosis of sebocytes. Suppression of sebum production is therefore the result of the induction of targeted therapeutic involution of the sebaceous gland (Nelson *et al.* 2006).

The induction of apoptosis is also considered to be the underlying mechanism of multiple side effects. Isotretinoin is a pro-drug converted intracellularly to metabolites ATRA (all-trans-retinoic acid) and 4-oxotretinoin that act as agonists of RAR (retinoic acid receptor) and retinoid X receptor nuclear receptors. Interindividual variability in plasma concentrations of isotretinoin metabolites may explain the differences in the intensity of the therapeutic response and in the severity and type of adverse reactions.

An active intracellular form of isotretinoin is likely ATRA, which is mediating its therapeutic effect (Tsukada *et al.* 2000). Upon binding to RAR, ATRA upregulates the expression of the FoxO3a (Forkhead box O3) transcriptional factor. The DNA-binding element for FoxO3a is located in the promoter region of the TRAIL (tumor necrosis factor-related apoptosis inducing ligand) gene. The expression of TRAIL is increased in sebocytes of patients treated with isotretinin (Kelhälä *et al.* 2016). Caspase cascade is activated by TRAIL (caspases 8 and 3), which results

in apoptosis of sebocytes. The expression of FoxO1 (Forkhead box protein O1) is further induced by FoxO3a. Subsequently, the expression of p21 and p27 cell cycle inhibitors is upregulated by FoxO1. The reduction in the inflammatory component of acne occurs through a decrease in the expression of Toll-like receptor 2 on peripheral blood monocytes, which is significantly increased in patients with acne and is implicated as a key molecule in the immune response against commensal Cutibacterium acnes.

Inflammation is also reduced indirectly through the alteration of the microenvironment of the pilosebaceous unit, where the conditions within this anatomical structure become very unfavorable for the colonization of Cutibacterium acnes (Dispenza *et al.* 2012). Isotretinoin also inhibits comedogenesis by reducing hyperkeratinization, but the mechanism is yet to be elucidated (Layton 2009).

Clinical implications in ophthalmology

Despite the undeniable efficacy of isotretinoin, its therapeutic use in the treatment of acne is significantly limited by its side effect. Current evidence shows that most of the ocular side effects are reversible upon the cessation of therapy (Egger *et al.* 1995). While adverse effects of systemic retinoids on the eye are among the most common, there is only limited scientific evidence describing their underlying mechanisms.

Ocular adverse effects of isotretinoin are divided into several categories according to the presumed causality (see tab. 1). For the sake of clarity and scope of this article, the following text will focus mainly on side effects with a high probability of causality and those best described in scientific literature (Fraunfelder *et al.* 2001).

Abnormal secretion of meibomian glands and blepharoconjunctivitis

The most commonly experienced ocular side effect of isotretinoin is abnormal secretion and atrophy of meibomian glands, which subsequently leads to the development of blepharoconjunctivitis.

Meibomian glands are exocrine glands with a holocrine type of secretion. Their product is an oily substance that prevents the evaporation of the protective tear film of the eye, interferes with bacterial colonization and slows the flow of tears. Isotretinoin induces apoptosis of meibomian cells by a mechanism analogous to that of sebaceous gland sebocytes apoptosis (Ding *et al.* 2013). In addition to apoptosis, isotretinoin also causes ductal keratinization, subsequent obstruction, gland cell degeneration, periacinar fibrosis, and glandular atrophy.

Evaporation and destabilization of the tear film and dryness of the eye are the cause of ocular discomfort, which can be clinicaly described as burning, tearing and redness of the eye. Damage to the tear film can also result in contact lens intolerance. Blepharo-conjunctivitis also appears to be caused by a decrease in the functional capacity of the meibomian glands, destabilization of the tear film and the consequent predisposition to infection. This decrease correlates with the histopathological finding of glandular acinar atrophy (Lambert, Smith 1988).

It is important to bear in mind that the chronic inflammatory process may trigger the development of malignancy of the affected area (Furdová *et al.* 2003). In the area of eyelid especially the inner corner of the eye, basal cell carcinoma is commonly encountered (Furdová *et al.* 2015). This can lead to serious cosmetic defects (Furdová, Lukačko 2016; Furdová *et al.* 2019).

The treatment of isotretinoin-associated meibomian gland dysfunction is mainly symptomatic. However, even such palliative therapy is very effective and can significantly contribute to improving the quality of life of a patient with the chronically dry eye. The mainstay of the treatment is the application of artificial tears into the conjunctival sac (Černák, Černák 2007). Warm compresses and massage may induce meibomian gland secretion and can also provide symptomatic relief. Another promising procedure is LipiFlow from TearScience. It is an outpatient treatment that uses therapeutic application of heat and pulsating pressure to express obstructed meibomian glands (Moy *et al.* 2015).

Decreased dark adaptation

Decreased dark adaptation is another common ophthalmic side effect of isotretinoin. It is usually reversible upon the cessation of therapy. However, irreversible dark adaptation disorders associated with isotretinoin treatment have also been described (Fraunfelder 2004).

The activation of retinal photoreceptors involves the isomerization of 11-cis retinal to all-trans retinal, which triggers a c ascade of chemical reactions

generating an electrical signal which proceeds to the optic nerve. 11-cis retinol dehydrogenase is a microsomal enzyme responsible for the recycling of 11-cis retinal. Isotretinoin has been shown to slow rhodopsin regeneration by inhibiting 11-cis retinol dehydrogenase (Sieving *et al.* 2001).

Since the vast majority of cases are reversible, decreased dark adaptation is not a reason for therapy discontinuation. Patients should be carefully informed since their ability to drive in poor weather conditions may be partly altered. The effect of isotretinoin use on vision must be assessed individually in occupations where good night vision is essential (Mollan 2006).

Other ocular side effects

Several case reports describe the rare finding of transient myopia associated with isotretinoin treatment.

Table. 1 Adverse Ocular Effects of Isotretinoin (Frauenfelder *et al.* 2001)

Certain causality	
Abnormal meibomian gland secretion	Keratitis
Blepharoconjunctivitis	Meibomian gland atrophy
Corneal opacities	Myopia
Decreased dark adaptation	Ocular discomfort
Decreased tolerance to contact lens	Photophobia
Increased tear osmolarity	Teratogenic ocular abnormalities
Decreased vision	Ocular sicca
Probable causality	
Decreased color vision	Permanent loss of dark adaptation
Possible causality	
Corneal ulcers	Diplopia
Idiopathic intracranial hypertension with optic disk edema	Eyelid edema
Optic neuritis	Permanent sicca-like syndrome
Subconjunctival hemorrhage	

This usually occurs at the beginning of treatment as a sudden visual acuity disorder. Myopia disappears after the treatment cessation. The underlying mechanism is yet to be elucidated. Isotretinoin treatment is thought to cause myopia only in previously predisposed individuals (Palestine 1984; Fraunfelder *et al.* 1985; Martínez-González *et al.* 2007).

Corneal opacities are another condition associated with isotretinoin use, only described on the level of case reports. Again, the mechanism of its development has not yet been precisely elucidated. This disorder is often asymptomatic and is usually diagnosed incidentally on a routine ophthalmologic examination. Appropriate management requires close monitoring (Ellies *et al.* 2000). Isotretinoin is absolutely contraindicated in pregnancy due to its teratogenicity.

Teratogenic eye abnormalities are part of the fetal retinoid syndrome, a complex of several serious congenital defects associated with fetal exposure to systemic retinoids. Teratogenic abnormalities of the eye include microphthalmia, orbital hypertelorism, and optic nerve hypoplasia (Fraunfelder *et al*. 1985). Thanks to the strict monitoring of treatment and appropriate and effective education of patients of reproductive age, fetal retinoid syndrome is currently extremely rare and belongs to the list of so-called Orphan diseases. The induction of apoptosis is currently considered to be the central mechanism of teratogenic action. The action of ATRA during intrauterine development significantly affects gene expression and induces apoptosis in the cells of the cranial part of the neural crest, which ultimately leads to the above-mentioned malformations (Melnik 2007).

CONCLUSION

This review provides a comprehensive synopsis of current evidence-based information available on the topic of the mechanisms of action and ocular side effects of systemic retinoids. To our knowledge there is a very limited number of studies available concerning this area, despite the clinical significance of this topic.

Ophthalmology specialists should be well informed about the pitfalls in the management of patients on isotretinoin therapy and thus the main purpose of this article was to shine a light on this important topic.

CONFLICT OF INTEREST

We have no conflict of interest to declare

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BREAST RECONSTRUCTION WITH DERMAL SLING FLAP – SURGICAL TECHNIQUE

REKONŠTRUKCIA PRSNÍKA POMOCOU DERMÁLNEHO LALOKA – OPERAČNÁ TECHNIKA

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ABSTRACT

Introduction: Reconstructive breast surgery is part of a comprehensive treatment for breast cancer. Awareness, education, self-examination techniques and regular medical examinations brought an increase in the early detection of breast oncopathologies, which lead to an increase in oncosurgical procedures with subsequent reconstruction. One of the reconstruction option is breast reconstruction using a dermal sling. Breast reconstruction using an implant and a dermal sling is a surgical technique that uses a double skin cover of the implant during immediate reconstruction in ptotic and large breasts.

Objective: The aim of this work is to describe the theoretical knowledge about breast reconstruction with a focus on reconstruction using the dermal sling in immediate reconstruction surgery. The aim is also to introduce surgical techniques as a possibility of directing the patient in the treatment process to oncologists and surgical oncologists.

Core of work: The core of our work categorises the reconstruction using the dermal sling as an immediate reconstruction in ptotic breasts and at the same time describes in detail the planning of the surgical marking and the surgery itself.

Conclusion: Theoretical work describing the surgical technique using the dermal sling summarises the reconstruction as an affordable, reliable and safe method of immediate reconstruction, it belongs to the complex oncosurgical treatment of breast disease. Last but not least, it is more cost-effective than popular methods using acellular dermis and other types of meshes. Minimising the use of foreign materials leads to a reduction in the tissue morbidity of the reconstructed tissue.

Key words: breast reconstruction, dermal sling, surgical oncology

ABSTRAKT

Úvod: Rekonštrukčná chirurgia prsníka predstavuje súčasť komplexnej liečby karcinómu prsníka. Osveta, edukácia, samovyšetrovacie techniky a pravidelné lekárske prehliadky priniesli vzostup skorého záchytu onkopatológií prsníkov, ktoré vedú k vzostupu onkochirurgických výkonov s následnou rekonštrukciou. Jednou z rekonštrukčných možností je Rekonštrukcia prsníka pomocou dermálneho laloka. Rekonštrukcia prsníka pomocou implantátu a dermálneho laloka predstavuje chirurgickú techniku, ktorá využíva dvojplášťové krytie implantátu počas okamžitej rekonštrukcie pri ptotických a veľkých prsníkov.

Cieľ: Cieľ práce je popísať teoretické znalosti o rekonštrukcii prsníka so zameraním na rekonštrukciu pomocou dermálneho laloka pri okamžitej rekonštrukčnej operácii. Cieľom je aj predstavenie operačnej techniky ako možnosti smerovania pacienta v liečebnom procese onkológom a onkochirurgom.

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Jadro práce: Jadro práce kategorizuje rekonštrukciu pomocou dermálneho laloka ako okamžitú rekonštrukciu pri ptotických prsníkoch a zároveň detailne opisuje plánovanie operačného nákresu a samotnej operácie.
Záver: Teoretická práca opisu chirurgickej techniky pomocou dermálneho laloka sumarizuje rekonštrukciu ako dostupnú, spoľahlivú a bezpečnú metódu okamžitej rekonštrukcie, patrí do komplexnej onkochirurgickej liečby ochorenia prsníka. V neposlednom rade je ekonomicky výhodnejšia ako populárne metódy využívajúce acelulárnu dermu a iné druhy sieťok. Minimalizácia použitia cudzorodých materiálov vedie k zníženiu morbidity tkanív rekonštruovaného tkaniva.

Kľúčové slová: rekonštrukcia prsníka, dermálny lalok, onkochirurgia

INTRODUCTION

Reconstructive breast surgery is part of the practice of a plastic surgeon. For laypersons as well as the professional public, breast surgery is associated with breast enlargement by means of implants. The indicative breadth of breast surgery is broad and ranges from developmental birth defects such as Poland syndrome, through breast hypertrophy, to reconstructions due to cancer (Dražan *et al.* 2006).
All surgeries on the breast have a common aim, namely to achieve aesthetically acceptable volume-shape proportions of the breast, provide a sense of confidence and improve the quality of life of a woman. Individualisation and selection of the procedure tailored to an individual patient is essential in oncological reconstructions. Individualisation is used to assess the technical possibilities of the surgery, to assess the quality and quantity of usable tissue suitable for the reconstruction. Even in demanding surgeries such as creating a new breast, we try to get as close as possible to the patient's ideas with regard to the technical possibilities of the surgery (Bland *et al.* 2011).

The nature of the oncological disease determines the possibility of breast reconstruction. It is important to know at what stage the disease has been diagnosed, whether the nodes are affected, whether the contralateral breast is affected, or whether the systemic spread of the disease is already present. The local finding, extent, size, frequency and location of the tumour itself are other important parameters. All these variables must be considered and only after that it is possible to select suitable patients for the reconstruction. The oncologist has a crucial impact in approving the reconstruction (Hunt *et al.* 2008).

Despite the worldwide trend of balancing mortality between mastectomy and breast-conserving surgery, there is an increase in the number of mastectomies (Dragun *et al.* 2013). Along with the increasing number of mastectomies, there is an increase in the requirements for breast reconstruction after mastectomies, where expanders, implants, pedicled and free flaps are used. Reconstructions with expanders and implants also dominate the field of reconstructive procedures (Djohan *et al.* 2008).

In terms of time, we divide reconstructions into immediate reconstruction (breast removal is immediately reconstructed after tumour removal), delayed-immediate (breast is reconstructed shortly after tumour removal, but after determining the definitive histological nature of the tumour) and delayed reconstruction (reconstruction is done months up to years after tumour removal).

We divide reconstructions according to the material used into autologous (fat, flaps, microsurgery), reconstructions using artificial material (expanders, expander-implants, implants, meshes) and combinations of artificial and body material (Boháč 2017).

Breast reconstruction with the dermal sling is one of the immediate breast reconstructions that use autologous tissue in combination with an implant (Carstensen 2019).

AIM

The aim of the article is to describe the theoretical knowledge about breast reconstruction with a focus on the reconstruction with the dermal sling in immediate reconstruction surgery. The aim is also to educate plastic surgery departments about the surgical

technique of the operation and to offer the possibility of directing a patient to oncologists and surgical oncologists.

PRINCIPLE

Breast reconstruction with the dermal sling is an immediate breast reconstruction that uses autologous tissue in combination with an implant. The principle of the reconstruction is to leave a de-epithelialised inferior dermal sling, in a skin-sparing mastectomy, which serves to complete the submuscular pocket and form a double skin implant envelope (Hansson *et al.* 2019).

This technique has recently gained popularity to the detriment of the use of the acellular dermis (Hon *et al.* 2017).

The rise in popularity stems from the surgical nature of this technique. We know that 32.3% of implant reconstructions and 26.2% of expander reconstructions show some degree of post-operative complications (Srinivsa *et al.* 2017). These numbers force surgeons to improve the surgical techniques. The beginnings of the use of implants for breast reconstruction have brought a high degree of extrusion of the implant through the weakened lower pole of the breast. Subsequently, the use of the acellular dermis came, which has a firm place in the reconstructive ladder of breast surgery. The use of autologous tissue in the form of a dermal sling is superior to the acellular dermis in terms of tissue survival and vascularity of the dermis as a covering layer of the implant. At the same time, when using the dermal sling, there is less morbidity of the reconstructed site compared to the technique of creating a pocket for the implant using only muscle structures (Ladizinsky *et al.* 2013).

Historically, the dermal sling technique was first described by John Bostwick in 1990 as a de-epithelialised elliptical dermal sling left during mastectomy, which serves to cover the lower pole of the implant (Ladizinsky *et al.* 2013).

The surgical technique of the de-epithelialised dermal sling is suitable for hypertrophic and ptotic breasts, where there is enough usable tissue.

Reconstruction using a de-epithelialised dermal sling is divided into dermal sling with a Wise pattern, vertical and horizontal modification of the technique (Hansson *et al.* 2019).

Reconstruction using a de-epithelialised inferior dermal sling is more cost-effective than primary reconstructions using the acellular dermis. It has a lower rate of seroma formation compared to the acellular dermis, but the surgery takes on average thirty minutes longer than with the use of meshes (Hon *et al.* 2017).

Surgical Technique During Wise Pattern Dermal Sling Reconstruction

Marking

Before the surgery, it is necessary to make photo documentation after which we then proceed to the marking of skin incisions and placement of the implant. We make the marking while the patient is standing with the limbs close to the body. We begin with the medial line from the jugular fossa to the xiphoid process. We continue with the sternal line, which defines the boundary of the medial preparation. Then we mark the original inframammary fold. The inframammary fold is a key orientation element, which we try to maintain at all costs also during the mastectomy. From the inframammary fold, we indicate the height of the breast, which is defined by the height of the implant and should correspond to the height of the original breast mass. Then we mark the anterior axillary line, which defines the lateral boundary of the preparation. Then we mark the location of the implant and proceed by defining the height of the neonipple and determining the lengths of the arms of the Wise pattern. A schematic representation of the marking is illustrated in Figure 1.

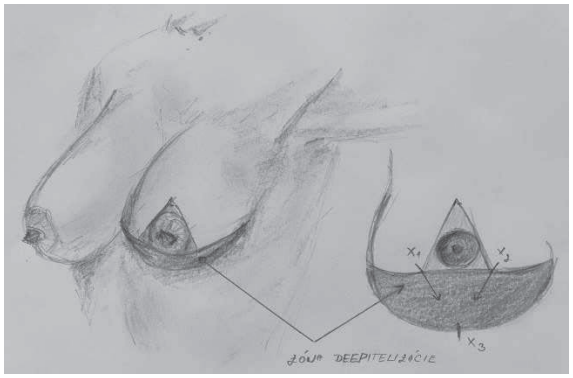

Figure 1. Outline of the marking. We suture the mastectomy flaps X1 and X2 to point X3
(Source: Author).

Unlike a typical Wise pattern, we mark the arm spacing angle as low as possible. Arm spacing is also drawn as narrowly as possible due to limited

vascularity after mastectomy (Hansson *et al.* 2019; Carstensen 2019). The described method of marking will allow us a minimal vertical component in significantly ptotic breasts, or in some cases we will only achieve a horizontal cut (Ladizinsky *et. al.* 2013).

Surgery

The surgery is performed after a sterile preparation of the operating field under general anaesthesia with the patient in a supine semi-sitting position with outstretched upper limbs. The surgery itself begins with the infiltration of the diluted local anaesthetic with adrenaline and the de-epithelialisation of the inferior dermal sling of the breast in the sense of the markings. Then we perform arm incisions and an incision around the inferior de-epithelialised dermal sling. Subsequently, we elevate the inferior de-epithelialised dermal sling in the mastectomy plane. It is important to maintain the inframammary fold in this step. If the inframammary fold is disturbed in any way during the mastectomy, it must be reconstructed. Otherwise there is a danger in the form of an implant shift. By preparation of the inferior dermal sling, we create an extensive approach to the mammary gland and continue with preparation in the mastectomy plane in the lateral, cranial and medial direction. Subsequently, we separate the mammary gland from the base with a view to preserving the fascial structures of the pectoralis major. After mastectomy, we elevate the pectoralis major and thus create a cranial-medial border of the pocket for the implant placement. A modification of the technique with a large implant can also be the elevation of the serratus anterior muscle or its fascia and the formation of a pocket border in the lateral direction. Subsequently, we insert the implant into the prepared pocket, insert the drains and perform a suturing of the inferior dermal sling to the edge of the pectoralis major. In the case of a wide chest with the need to use a wide implant, it is necessary to incise a de-epithelialised inferior dermal sling on the lateral side, the so-called back-cut. Thus, we achieve mobilisation of the dermal sling and the possibility of closing the muscle-dermal pocket (Carstensen 2019). In this way, the implant is covered in one layer by a muscle and a de-epithelialised dermal sling. In the next step, we bring the arms of the Wise pattern closer to each other and to the inframammary fold, introduce additional drains and suture in anatomical layers. The adipocutaneous dermal slings should ideally be sutured without any tension. In this way, we create a second layer of implant cover using adipocutaneous dermal slings of the breast (Hon *et al.* 2017). The double skin cover of the implant is shown in Figure 2. The preoperative condition is documented in Figure 3. The post-operative outcome eight months after the surgery is documented in Figure 4.

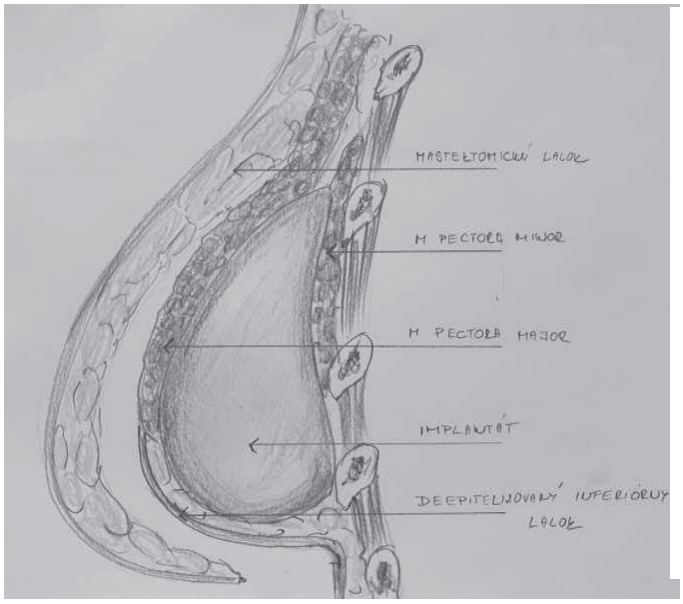

Figure 2 – Double skin cover of the implant (Source: Author).

Figure 3. Preoperative condition (Source: Author).

Figure 4. Eight months after the dermal sling and implant reconstruction. Before the areola restoration tattooing (Source: Author).

Post-operative Care and Further Direction of the Patient

The first suture treatment after surgery is usually done the second post-operative day, Redon drains can be removed if less than twenty ml / 24 hours of waste is achieved. As a rule, the patient stays in the hospital for 5 days. Follow-up inspections are after two weeks, a month, three months and after half a year, when the reconstruction of the areola and nipple is usually started. Oncology dispensarisation is in the hands of an oncologist and surgical oncologist (Wei *et al.* 2017).

Complications

The most common specific complications of breast reconstruction with the dermal sling include: low inframammary fold, necrosis of the mastectomy dermal sling, formation of seromas and hematomas in the double skin envelope around the implants, wound dehiscence, and implant exposure (Hon *et al.* 2017).

Surgical Technique in Vertical and Horizontal Modification of the Dermal Sling

These modifications have limited indication criteria, which are given by the dimensions of the mastectomised, reconstructed breast. With the vertical modification, we do not make an incision in the inframammary fold and the de-epithelialised dermal sling is significantly narrower. In the horizontal version, the de-epithelialised dermal sling is as wide as in the classical Wise pattern, but is significantly shorter (Hansson *et al.* 2019).

CONCLUSION

For a woman, the awareness of any physical deformity of sexual characteristics is devastating both physically and mentally. Today, patients not only want to survive breast cancer, but want a full life after breast cancer. Therefore, breast reconstruction is considered as a part of the oncological treatment of breast disease. However, it is still true that life-saving basic treatment in the form of mastectomy, chemotherapy and radiotherapy is in the first place.

In any oncosurgical procedure, the oncological diagnosis always comes first, which must not be bent for the purpose of aesthetic reconstruction requirements of the plastic surgeon. We must not forget the psychological side of the procedure. It is a demanding process, the disease itself is so exhausting for the patient that sometimes she is not interested in complicated reconstruction surgery. One of the key elements of oncoreconstruction is the individualisation of surgical interventions, both in terms of achieving the ideal shape of the new breast, and at the same time reducing the possible risks and complications of surgery. After considering the indicative criteria for breast reconstruction, reconstruction using the dermal sling is an ideal choice for ptotic breasts. After mastering the surgical techniques, this procedure is reliable and very effective due to the safe double skin cover of the implant. A huge advantage over other reconstruction techniques is that there is no need to use a mesh, whether in the form of an acellular dermis or as an artificial material. This greatly favours the economic

aspect of the hospitalisation case. In the indicated cases, especially in the predisposition to a tissue blood flow disorder, such as the history of radiotherapy or smoking, it is advisable to consider the use of an expander instead of an implant. This relieves the tissues from pressure, the disadvantage is the subsequent need to replace the expander. The aim of this article is to present theoretical knowledge of the surgical technique. With this relatively rare procedure, no data have been published comparing variations in individual surgical techniques in terms of aesthetics and tissue morbidity. The description of the surgical technique itself, in general, is quite difficult to compare with other works. We see the benefit of this article in the description and explanation of the details of the marking, with an emphasis on the preservation of tissue vascularity and on the preservation, or more precisely reconstruction of the inframammary fold. Another benefit of the publication is the definition of the performance as a standard for reconstruction in the case of ptotic breasts with maximisation of an implant protection. This allows oncologists and surgical oncologists to direct the patient to reconstructive surgery at the time of diagnosis, thus preventing the psychological moment when the patient wakes up after surgery without a mammary gland with a mutilated chest.

Conflict of Interests

The author declares that he has no conflict of interest in connection with the published work.

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POSTPARTUM PHYSIOTHERAPY OF DIASTASE MUSCULI RECTI ABDOMINIS

POPÔRODNÁ FYZIOTERAPIA DIASTÁZY MUSCULI RECTI ABDOMINIS

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ABSTRACT **Introduction:** Diastasis of the direct pectoral muscle mainly affects women, but it can also affect children and men. This is a more pronounced pathological separation of the right and left parts of the rectus abdominis muscle from each other in the area of the linea alba. The most common causes of diastasis in women are pregnancy, improper and inappropriate exercise in the postnatal period.

Purpose: Appropriately chosen kinesiotherapy corrects diastasis, alleviates the accompanying difficulties and can thus prevent any necessary surgical solution.

Core: In the case study, we focused on the use of medical rehabilitation methods for 5 months. We focused on exercises for the deep stabilization system (HSS), exercises according to Julia Tubler to close diastasis of the rectus abdominis, diaphragmatic breathing, exercises to strengthen the pelvic floor, posture correction and recommendations for activities of daily living. We also used the technique of kinesiotaping. According to the final examination, the extent of abdominal diastasis as well as associated difficulties improved.

Conclusion: There is relatively little public awareness of this diagnosis, but physiotherapists also lack information about treatment options of this kind. We describe this issue in more detail and choose the most suitable ways of conservative and physical therapy.

Key words: diastasis. musculi recti abdominis. kineziotherapy. physiotherapy.

ABSTRAKT **Úvod:** Diastáza priameho bušného svalu sa týka hlavne žien, ale može sa prejaviť aj u detí a mužov. Ide o výraznejšie patologické oddelenie pravej a ľavej časti priameho brušného svalu od seba v oblasti linea alba. Najčastejšou príčinou diastázy u žien býva tehotenstvo, nesprávne a neprimerané cvičenie v postnatálnom období.

Cieľ: Vhodne zvolenou kinezioterapiou dochádza k úprave diastázy, zmierneniu sprievodných ťažkostí a možno tak predchádzať prípadnému potrebnému chirurgickému riešeniu.

Jadro: V prípadovej štúdii sme sa zamerali na využitie metód liečebnej rehabilitácie po dobu 5 mesiacov v súkromnom centre Rehamedpiešťany. Sústredili sme sa na cviky na hlboký stabilizačný systém (HSS), cvičenie podľa Julie Tublerovej na uzatvorenie diastázy musculi recti abdominis, bráničné dýchanie, cvičenie na spevnenie panvového dna, korekciu postúry a odporúčania pre aktivity denného života. Využili sme aj techniku kineziotejpingu. Podľa výstupného vyšetrenia došlo k zlepšeniu rozsahu brušnej diastázy ako aj pridružených ťažkostí.

Záver: O tejto diagnóze je pomerne malá informovanosť verejnosti, ale aj fyzioterapeutom informácie o možnostiach liečby tohto druhu chýbajú. Podrobnejšie opisujeme túto problematiku a volíme pre ňu najvhodnejšie spôsoby konzervatívnej a pohybovej liečby.

Kľúčové slová: diastáza. musculi recti abdominis. kinezioterapia. fyzioterapia.

INTRODUCTION

Musculi recti abdominis (DMRA) is a term for the pathological spacing of the rectus abdominis muscle at the linea alba, which is the fibrous junction of the rectus abdominis but is also the site of attachment of all the muscles of the abdominal wall. Recent research has looked at diastasis in a broader context, pointing to the occurrence of diastasis in a population of patients with stress incontinence and the relationship between diastasis and L-spine pain (Koubková *et al.* 2019). Impaired stabilization function of the spine is the main cause of spinal pain (Gajdoš *et al.* 2015). One of the important solutions to diastasis of the musculi recti abdominis is physiotherapy, the aim of which is to induce proper muscle interaction and coordination between all involved abdominal muscles.

There is relatively little information about this diagnosis and the public, but physiotherapists also lack information about treatment options of this kind.

Incidence and etiopathogenesis

The causes of DMRA can be divided between functional and structural. The abdominal muscles, namely the obliquus externus abdominis muscle, the obliquus internus abdominis muscle, the transversus abdominis muscle and the rectus abdominis muscle, must cooperate in activation. Surgery, childbirth, incorrect movement stereotype can disrupt this interplay, which leads to the development of muscle imbalance and thus to the aforementioned suboptimal function of the abdomen (Poděbradská 2018).

Diastasis commonly occurs in pregnant women in the third trimester due to growing uterus and shortly after pregnancy. It is considered a physiological phenomenon in this group of patients. The literature indicates that up to 38% of women do not spontaneously close the gap and the abdominal wall defect needs to be addressed. (Lee 2008).

Prevention

Prevention of diastasis consists in eliminating the factors that lead to its occurrence, strengthening the abdominal muscles even during pregnancy significantly improves the course of childbirth and reduces the incidence of diastasis (Traci, Johnson 2018).

DMRA Solution Options

Conservative and surgical. The foreign literature mainly discusses the surgical solution, which compares individual techniques, surgical approaches and materials used.

Conservative therapy

There is little mention of conservative DMRA therapy in foreign but also in Slovak literature. Therapies aimed directly at influencing DMRA are reported only rarely in the literature. Possibilities of kinesiotherapy DMRA focuses mainly on exercise, which induces coordination and optimal muscle interaction between all abdominal muscles (Prokešová 2018).

Strengthening m. m. rectus abdominis with manual abdominal wall correction

The practitioner crosses his arms at the level of the navel on both sides. When exhaling, he slowly raises his head and at the same time pushes on his rectum with both hands in the middle line.

Dynamic neuromuscular stabilization (DNS)

"Through the techniques of dynamic neuromuscular stabilization according to Kolář, we can influence the function of a muscle in its postural-locomotor function. Strengthening exercises are derived from the distance and tightening of muscle, but also from their integration into biomechanical chains. DNS is an educational procedure, the aim of which is to get the individual under free control of the correct muscle interaction and to include it in the normal daily activities (Šafářová, Kolář in Radvanský 2011).

Exercise according to Julia Tupler

The exercise according to Julie Tupler for the treatment of diastasis musculi recti abdominis was developed by a registered nurse, a certified pedagogue. The Tupler technique program lasts 18 weeks, but the exercises must continue after this time limit in order to maintain the resulting effect. Emphasis is placed on wearing a support belt, kinesiotherapy focused on m. There. Musculus rectus abdominis and education of common daily activities such as the right form of

getting up and lifting the child. Tubler's technique recommends wearing a support belt for the duration of the program.

Exercises focused on a deep stabilization system

"Activation of the Deep Stabilization System (HSS) is important in normal daily activities. While sitting, we dig our fingers into the hips under the last ribs and try to activate the muscles by pushing against the fingers. When lying on our backs, we dig our fingers into the lower part of the abdomen and try to push against them. This exercise can later be supplemented with exercises to strengthen the pelvic muscles. e.g. exercise according to Ľudmila Mojžišová, Kegel's exercise (Gajdoš *et al.* 2015)

Incontinence and DMRA

Functional involvement of the pelvic floor requires some internal muscle coordination. The cause of pelvic floor dysfunction, resp. urinary incontinence is when animal function is insufficiently coordinated (Špringrová 2012).

DMRA and back pain

The main cause of low back pain (LBP) is a disorder of stabilizing function. In general, DMRA is not considered to be the cause of pain, but inappropriate spacing can affect the ability of the abdominal muscles to participate in stabilizing the torso and spine. Impaired spinal stabilization function is a major cause of back pain (Gúth 2019).

Our aim was to verify the effect of physiotherapy therapy on the closure or improvement of DMRA and to evaluate the effect of five months of physiotherapy care.

Exercise according to Julia Tupler

We included in the therapy an exercise according to Julia Tupler recommended in the foreign literature (Fitzgerald, Kotarinos 2003) as a suitable conservative therapy for DMRA closure. Julia Tupler's practice is widespread, especially in the United Kingdom and the United States.

Kineziotaping

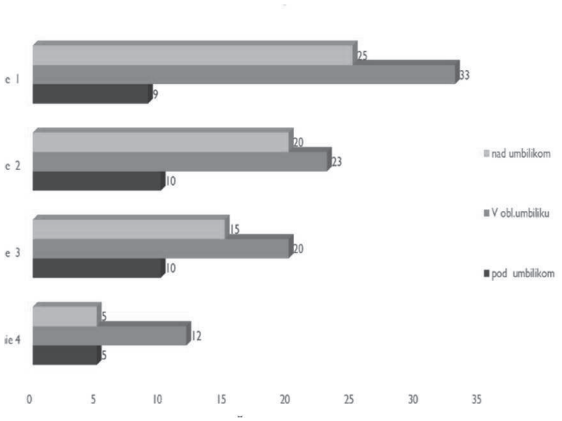
Another option we used during physiotherapy was kinesiotaping. The main purpose was effective correction and to help the abdominal muscles to function properly. It is ideal to use this as soon as possible, because any help to the proper functioning of the muscles in the initial stages is beneficial.

Table 1. Diastasis m. rectus abdominis after 5 months of treatment in cm

Place of measurement	*Patient*	*Difference*
The upper edge of the umbilical cord	*1,2cm*	*2,1 cm*
4,5 cm above the upper edge of the umbilical cord	*0,9cm*	*1,6 cm*
4 cm below the lower edge of the umbilical cord	*0,5cm*	*0,5cm*

(Source: Custom measurement)

Physiotherapy resulted in an objective finding within five months and there was also a reduction in the extent of diastasis, see (graph 1) graphical representation of changes during physiotherapy.



Graph 1 Width of diastasis
(Source: own processing)

DISCUSSION

Possibility of physiotherapeutic treatment of direct abdominal muscle diastasis in a woman who was 5 months postpartum. During pregnancy, the presence of DMRA is common due to biomechanical and hormonal changes. Separation is attributed to hormonal effects on tissues, muscle strain and excessive tissue stress in the last trimester of pregnancy. Spontaneous closure of the gap occurs mostly after childbirth, in the period from 6 to 8 weeks, but in 30% of women diastasis persists.

Up to 30% of women report long-term health problems persisting after a delayed period after childbirth (Bowman 2016).

Postpartum is also referred to as the fourth trimester, when there is a regeneration of changes accompanied by pain experienced during uterine involution, pain in the perineal region, pain in the lumbar and sacral spine, pain in the pelvic ring. During pregnancy, the hormone Relaxin v (corpus luteum) is produced. Its level is higher in repeated and multiple pregnancies. It loosens articular connections and has an effect on the reduced production of collagen and elastin, ie the stiffness of the ligaments. Creates laxity of joints and ligaments.

The role of a physiotherapist in the postpartum period consists in education, training for general postpartum rehabilitation, support, counseling.

The most common postpartum complications from the point of view of postpartum physiotherapy include pelvic floor pain - PGP (Pelvic Gridle Pain) with pelvic floor drop, painful coccyx, postpartum uterine prolapse, incontinence, abdominal wall, diastasis of direct abdominal muscles and DMRA) caesarean section, sectio caesarea, if made. Postpartum rehabilitation is focused immediately after birth on the conscious contraction of the abdominal muscles, pelvic floor muscles, posture, body movement in space and daily activities.

Restoration of breathing is very important, ideally lying on the abdomen, when the pad provides the missing support of the abdominal muscles.

It is also important to focus on positioning in the home environment for better wrapping of the uterus, lying on the abdomen with a pillow under the uterus or on the back with a bag weighing 1-2 kg. The position for breastfeeding lying on the back is a resting position and can be used to activate the abdominal muscles and stabilize the pelvis.

The sitting position of breastfeeding is unsuitable for this period, for painful pelvic floor or wounds after the section. Education on the method of emptying with the support of the abdominal wall is also needed.

Very important is the frequent, several times repetitive exercise set during the day aimed at withdrawing diastasis, restoration of pelvic floor muscle activity, pelvic stability, flexibility of the spine and posture and movement of the body, as well as training of diaphragmatic breathing in supine and supine on a belly. Lifting the chest in a supine position, ideal for breastfeeding.

It is inappropriate to perform various heavy housework, strength exercises, stretching, cranks, etc.

CONCLUSION

The main cause of insufficient treatment of diastasis in our country is the very low awareness of women about postpartum DMRA. Any woman who is pregnant should be informed of the possibility of diastasis in a antenatal clinic during pregnancy so that, in the event of multiple pregnancies, she can wear a support belt to reduce the size of the diastasis and facilitate postpartum recovery. If the diagnosis is confirmed, she should be referred for rehabilitation. We believe that this issue will be taken more actively in the near future.

Physiotherapy improved objective findings over a period of five months, reduced the extent of diastasis, improved urinary incontinence, and alleviated subjectively reported lumbar disorders.

Conflict of Interest
No Conflict of Interest

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EVALUATION OF THE ANALGETIC EFFECT OF TOTAL AND LOCAL CRYOTHERAPY IN THE ELDERLY PEOPLE

HODNOTENIE ANALGETICKÉHO ÚČINKU CELKOVEJ A LOKÁLNEJ KRYOTERAPIE U STARŠÍCH ĽUDÍ

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ABSTRACT

Introduction: Analgesic effect of total and local cryotherapy in people older than 55 years, in respondents with various diagnoses, most often with degenerative diseases. Especially with gonarthrosis, coxarthrosis, spondylosis, osteoarthritis and polyarthrosis.

Objective: The aim of the survey was to process information from the field of total and local cryotherapy and to analyze the information obtained using questionnaires. We process the percentage effect of total and local cryotherapy on the intensity of painful symptoms, feeling, tolerance and satisfaction of respondents after completing ten therapies.

Methodology: The group of respondents consisted of 35 men and 65 women aged 55 to 81 years. A total of 100 respondents qualified for the survey. 50 % of respondents participated in total cryotherapy and 50 % of respondents participated in local cryotherapy.

Results: We processed the results using MS Excel and IBM SPSS. The Laitinen Modified Pain Questionnaire was used. Due to established hypotheses and the nature of the data, we used the Kolmogorov-Smirnov normality test, the nonparametric Mann-Whitney U-test and the Wilcoxon nonparametric paired test. The results show that with the help of local and total cryotherapy, the intensity of painful symptoms is lower.

Conclusion: The performed analysis of the data by means of a questionnaire showed that local and total cryotherapy alleviates pain and has an analgesic effect.

Keywords: homiothermic being, vertebroalgic syndrome, Laitinen, vasodilation, vasoconstriction, total cryotherapy, local cryotherapy.

ABSTRAKT

Úvod: Analgetický účinok celkovej a lokálnej kryoterapie u ľudí starších ako 55 rokov, u respondentov s rôznymi diagnózami, najčastejšie s degeneratívnymi ochoreniami. Predovšetkým s gonartrózou, koxartrózou, spondylózou, osteoartrózou a polyartrózou.

Cieľ: Cieľom prieskumu bolo spracovávanie informácií z oblasti celkovej a lokálnej kryoterapie a analyzovať informácie získane pomocou dotazníkov. Spracúvame percentuálne účinok celkovej a lokálnej kryoterapie na intenzitu bolestivých symptómov, pocit, toleranciu a spokojnosť respondentov po absolvovaní desiatich terapií.

Metodika: Súbor respondentov tvorilo 35 mužov a 65 žien vo veku od 55 do 81 rokov. Do prieskumu sa kvalifikovalo celkovo 100 respondentov. Celkovej kryoterapie sa zúčastnilo 50 % respondentov a lokálnej kryoterapie sa zúčastnilo 50 % respondentov.

Výsledky: Výsledky sme spracovali pomocou programov MS Excel a IBM SPSS. Bol použitý dotazník modifikovanej bolesti podľa Laitinena Vzhľadom na stanovené hypotézy a povahu

dát sme použili Kolmogorov-Smirnovov test normality, neparametrický Mann-Whitneyho U-test a Wilcoxonov neparametrický párový test. Výsledky ukazujú, že pomocou lokálnej a celkovej kryoterapie je intenzita bolestivých symptómov menšia.
Záver: Uskutočnená analýza dát prostredníctvom dotazníka ukázala, že lokálna a celková kryoterapia zmierňuje bolesť a má analgetický účinok. U respondentov došlo k zníženiu sledovaných parametrov a zlepšeniu stavu fyzickej a psychickej kondície, zníženie množsta užívaných analgetík a mala vplyv aj na zlepšenie kvality života.
Kľúčové slová: homiotermná bytosť, VAS, laitinen, vazodilatácia, vazokonstrikcia, celková kryoterapia, lokálna kryoterapia.

INTRODUCTION

Significant advances in healthcare brought rising average life expectancy. Physiological and pathophysiological changes in the human body are associated with increasing age, as well as the frequency and incidence of various painful diseases. Physical treatment, which consists in the action of physical effects on the correct receptors, is recommended especially in the group of elderly patients due to the proven lower incidence, resp. absence of side effects (Łukasik 2011). Cryotherapy has an important place in physical therapy and therapy, because it is generally readily available and applicable to a wide range of diseases.

CRYOTHERAPY

It is part of thermotherapy, which belongs to the branches of physical therapy, and consists essentially in the removal of heat from the body. The physiological effects of cold treatment include reduction of pain, blood flow, swelling, inflammation, muscle cramps and metabolic demand. The analgesic effect of cryotherapy is to slow down the conduction of stimuli through nerve fibers and to reduce the irritability of receptors. If the pain is effectively managed, the patient may be able to begin and progress with therapy earlier to more quickly address range and strength deficits, as well as progress in full weight and function.

Local cryotherapy

Applying the effects of low temperatures to a certain part of the human body, a mixture of nitrogen vapor and cooled air ranging from −100 °C to −178 °C or cooled air ranging from −30 °C to −34 °C. Cooling of the affected area and the immediate surroundings leads to blockage of skin nociceptors, which are connected to the connective tissue around the affected joints. In healthy tissue, transient vasoconstriction and subsequent vasodilation occur. Cold blockade of skin nociceptors leads to a reduced perception of pain at the affected site.

Total cryotherapy

It is defined as the stimulatory application of cryogenic temperatures (from −100 °C to −160 °C) to the entire surface of the patient's body for a short time (1–3 minutes). Total cryotherapy (Whole Body Cryotherapy) affects the whole organism with different intensity, it causes biochemical, immunological and hormonal changes. Also, leaching of endorphins protects the body from stress, strengthens the performance of the immune system and induces euphoria. Last but not least, the efficiency, endurance and resilience of the central nervous system to fatigue and stress improve (Bettany-Saltikov 2012).

RESEARCH OBJECTIVES

The main goal was to analyze and evaluate the analgesic effect of local and total cryotherapy on pain in respondents older than 55 years, three hypotheses were established, which we examined.

Hypothesis 1: *We assume that there is a statistically significant reduction in perceived pain on the Laitinen scale after 10 total cryotherapies.*
Hypothesis 2: *We assume that there is a statistically significant reduction in perceived pain on the Laitinen scale after 10 local cryotherapies.*
Hypothesis 3: *We assume that there is a statistically significant difference between local and total cryotherapy in the reduction of pain perception on the VAS scale after 10 cryotherapies.*

Sample characteristics

100 respondents were included in the sample, of which 35 were men and 65 women. We qualify people

of both sexes, aged 55 and over with symptoms of pain. 50 % of respondents participated in total cryotherapy and 50 % of respondents participated in local cryotherapy. Each respondent was admitted to the group on the basis of a previous medical examination, which qualifies him for local or total cryotherapy.

METHODOLOGY

The results were processed using MS Excel and IBM SPSS. The Laitinen Modified Pain Questionnaire was used. Due to established hypotheses and the nature of the data, we used the Kolmogorov-Smirn normality test, the nonparametric Mann-Whitney U-test and the Wilcoxon nonparametric paired test. The values in the table 1 express how many times a given response occurs in 50 respondents in total cryotherapy and in 50 respondents in local cryotherapy. These are the results of the scoring of the questionnaire, then they were evaluated and a conversion to a percentage improvement was performed. Percentage improvement was calculated as the difference before and after the therapy relative to the pre-therapy state in percent, i.e. (x−y) / x * 100, where **x** is the pre-therapy condition, **y** is the post-therapy condition.

Hypothesis 1: *We assume that there is a statistically significant reduction in perceived pain on the Laitinen scale after 10 total cryotherapies.*

Based on the results of the Wilcoxon paired test, we can state that the perception of pain on the Laitinen scale decreased statistically significantly after 10 total cryotherapies. Hypothesis 1 was therefore confirmed

Hypothesis 2: *We assume that there is a statistically significant reduction in perceived pain on the Laitinen scale after 10 local cryotherapies.*

Based on the results of the Wilcoxon paired test, we can state that the perception of pain on the Laitinen scale decreased statistically significantly after 10 local cryotherapies. Hypothesis 2 was confirmed.

Hypothesis 3: *We assume that there is a statistically significant difference between local and total cryotherapy in the reduction of pain perception on the VAS scale after 10 cryotherapies.*

For hypothesis analysis, we used a nonparametric Mann-Whitney U-test for 2 independent selections, taking into account tests of distribution normality and the nature of variables.

Based on the results, we can state that there is a statistically significant difference between local and total cryotherapy in the percentage of pain reduction on the VAS scale after 10 cryotherapies. In particular, total cryotherapy reduced pain on a VAS scale statistically significantly more than local cryotherapy. Hypothesis 3 was confirmed.

DISCUSSION

Research suggests that the incidence of pain increases with age. The most common chronic pains, such as osteoarthritis or back pain, are so common that they are often considered a normal part of life (Cintulová, Beňo 2018). Chronic pain causes a complex set of physical and psychosocial changes that burden the respondent. Numerous scientific studies on the effect of cryogenic temperatures on the human body have shown that cryotherapy is a safe, effective and well-tolerated method of physiotherapy. It confirms the analgesic, anti-inflammatory and anti-edema effects of cryotherapy, as well as its beneficial effect on the mental state. Data collection took place at the workplace, which had specialized equipment for performing total cryotherapy – cryogenic chamber and equipment for performing local cryotherapy.

Respondents most often reported degenerative diseases, especially gonarthrosis, coxarthrosis, spondylosis and polyarthritis. Osteoarthritis is the most common disease of the musculoskeletal system and its incidence increases with age. When asked whether painkillers were used after cryotherapy, 21 % of respondents answered in the affirmative.

The pain was not as much lowered as to give up painkillers. However, in 42.86 % of respondents taking painkillers after cryotherapy, the dose was much lower after a series of ten treatments. As many as 74 % of respondents declared their sense of satisfaction and well-being after cryotherapy. Satisfaction with the effects of treatment obtained after cryotherapy was expressed positively by the vast majority of respondents. As many as 64 % of respondents said they were satisfied, 31 % of respondents said they were very satisfied. This satisfaction may be the result of reducing, alleviating or even eliminating the pain experienced (Gúth 2019).

A revised Laitinen pain assessment questionnaire indicated the following conclusions: 65 % of respondents achieved an improvement, while 35 % of respondents did not improve significantly. Thanks to the Laitinen questionnaire, we can describe the respondent's pain in a more thorough and better way. Compared to the VAS scale, Laitinen is more complex in assessing pain attributes. In respondents with limited physical activity due to the analgesic effect of

cryotherapy, the restriction was reduced by at least a quarter. The dose of pain medication during the cryotherapy series decreased in 63.89 % of respondents.

Tab. 1: Interpretation of the questionnaire on modified pain according to Laitinen – results of interpretation:

Intensity of pain	**N = 100**	**%**	**Total cryotherapy**		**Local cryotherapy**	
			N = 50	**%**	**N = 50**	**%**
No improvement 0 %	35	35	21	42	14	28
Unsatisfactory improvement 1 – 24 %	0	0	0	0	0	0
Satisfactory improvement 25 – 49 %	8	8	5	10	3	6
Good improvement 50 – 74 %	41	41	17	34	24	48
Very good improvement 75 – 100 %	16	16	7	14	9	18
Frequency of pain	**N = 100**	**%**	**N = 50**	**%**	**N = 50**	**%**
No improvement 0 %	36	36	25	50	11	22
Unsatisfactory improvement 1 – 24 %	0	0	0	0	0	0
Satisfactory improvement 25 – 49 %	6	6	1	2	5	10
Good improvement 50 – 74 %	43	43	18	36	25	50
Very good improvement 75 – 100 %	15	15	6	12	9	18
Use of painkillers	**N = 69**	**%**	**N = 32**	**%**	**N = 37**	**%**
No improvement 0 %	32	46,38	17	53,13	15	40,54
Unsatisfactory improvement 1 – 24 %	0	0	0	0	0	0
Satisfactory improvement 25 – 49 %	1	1,45	1	3,13	0	0
Good improvement 50 – 74 %	12	17,39	4	12,50	8	21,62
Very good improvement 75 – 100 %	24	34,78	10	31,25	14	37,84
Restriction of physical activity	**N = 91**	**%**	**N = 41**	**%**	**N = 50**	**%**
No improvement 0 %	52	57,14	30	73,2	22	44
Unsatisfactory improvement 1 – 24 %	0	0	0	0	0	0
Satisfactory improvement 25 – 49 %	3	3,30	0	0	3	6
Good improvement 50 – 74 %	18	19,78	6	14,6	12	24
Very good improvement 75 – 100 %	18	19,78	5	12,2	13	26

CONCLUSION

One usually perceives the smooth functioning of one's body as something self-evident. But with health problems, it seems that the quickest and simplest solution leads primarily to the use of painkillers, but of course they also have side effects. The results of the analysis of the data collected through the questionnaire showed that local and total cryotherapy in our respondents alleviates pain and has an analgesic effect. Cryotherapy also had an effect on the feeling of well-being. The vast majority of them observed an improvement in their condition after therapy. Respondents also noted that after several therapies, the coldness was progressively less pronounced, improving their tolerance to low temperatures (Hasa 2019). It supports the treatment of injuries and other diseases and has a general effect on strengthening the body and its immunity.

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MEASUREMENTS OF THE QUALITY OF LIFE IN CHILDREN WITH AUTISM AND IN THEIR FAMILIES WITH THE HELP OF PEDSQL™

MĚŘENÍ KVALITY ŽIVOTA DĚTÍ S AUTISMEM A JEJICH RODÍN POMOCÍ PEDSQL™

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ABSTRACT

Introduction: The purpose of the study presented here was to show how the children with autism and their families evaluate their quality of life compared to children and families without autism. The questionnaire PedsQL™ 4.0 considering the physical health score and age score, answered by children as well as parents, was employed as the principal research tool for the determination of the quality of life. The questionnaire PedsQL™ 2.0 designed for the parents was furthermore used, which is focused on the Family Impact Module (FIM), and in which they evaluate the situation in the family on the scale including the score of the family function and age score.

Methods: Fifteen families having children with autism spectrum disorders, aged 2 to 18 years, participated in the research. The fifteen children with the health handicap included seven girls and eight boys. The average age in children with autism was of 9.53. In healthy children considered for a comparison, it was of 11.7. Total of 120 questionnaires were completed.

Results: The results demonstrated that in the group with autism, a lower score, i.e. a worse quality of life was always detected. There was no statistically significant difference between 7-days and one-month versions of PedsQL™ 2.0.

Conclusion: The PedsQL™ 4.0 questionnaire demonstrated considerable differences between children with autism and healthy children. These results should be taken into consideration in evaluating needs of these children and their families.

Key words: Quality of life; PedsQL™; autism; families; children

ABSTRAKT

Úvod: Obsahem této studie bylo srovnat, jak děti s autismem a jejich rodina hodnotí svoji kvalitu života na rozdíl od dětí a rodin bez autismu. Jako hlavní výzkumný nástroj pro zjišťování kvality života byl využit dotazník PedsQL™ 4.0, zabývají se skóre fyzického zdraví, skóre psychosociální zdraví a věkového skóre, na nějž odpovídají děti i rodiče. Dále dotazník PedsQL™ 2.0 určen pro rodiče se zaměřuje na Family Impact Module (FIM), v němž hodnotí situaci v rodině na škále obsahující skóre fungování rodiny a věkové skóre.

Metodika: Výzkumu se zúčastnilo 15 rodin s dětmi s poruchou autistického spektra od 2 do 18 let včetně. Z 15 dětí se zdravotním znevýhodněním bylo 7 děvčat a 8 chlapců. Věkový průměr u dětí se autisme byl 9,53 a zdravých dětí byl 11,7. Celkem bylo vyplněno 120 dotazníků.

Výsledky: Výsledky prokázaly, že ve skupině autistů bylo vždy zaznamenáno nižší skóre, tedy horší kvalita života. Dále nebyl, zaznamenám statisticky významný rozdíl mezi 7 denní a měsíční verzí PedsQL™ 2.0.

Závěr: Dotazníky PedsQL™ 4.0 ukázaly veliký rozdíl v kvalitě života mezi dětmi s autismem a zdravými dětmi. Je nutné brát tyto výsledky v úvahu při posuzování potřeb těchto dětí a jejich rodin.

Klíčová slova: Kvalita života; PedsQLTM ; autismus; rodiny; děti

INTRODUCTION

Autism exerts numerous symptoms and manifestations disturbing not only the child life, but also the family life. It considerably negatively affects the child future, the inclusion and teaching methods, the social support based on contacts with family members, possibilities of the inclusion, etc. The standpoint of parents is of importance here in terms of the completeness of data acquired and comparison with children without the diagnosis of autism. It is also defined by a characteristic type of abnormal function in the field of psychopathology affecting three areas concerning limited stereotype behaviour, reciprocal social interactions and particularly communication (MKN 2020).

Quality of life

For physician and for second opinion activities, the parameter of the quality of life can be very important in understanding the general health condition of individuals. The quality of life is a universal concept, which is very difficult to study (Dobírková *et al.* 2018). The quality of life can be subjectively or possibly objectively evaluated. In the present research, the standardized questionnaire PedsQL™ (Paediatric Quality of Life Inventory) was chosen, which has been developed since 1997 (Cheng *et al.* 2016). In a research including 254 parents, Cheng, et al. concluded that PedsQL™ is a tool suitable for the measurement of the children quality of life with useful clinical consequences (Cheng *et al.* 2016).

PedsQL™

PedsQL™ are questionnaires measuring the quality of life in children and adolescents concerning the health (Varni 2020; Cheng *et al.* 2016). These questionnaires have been developed by J. W. Varnim since 1997 (Varni 2020; Gurková 2011). „PedsQL ™ is a valid, reliable, flexible (applicable in the community, in schools, in clinical paediatric practice) and multidimensional tool (it contains 4 subscales – the physical, emotional and social functions and the function in the school) for the measurement of the quality of life" (Varni 2020; Bruil 1999). The questionnaires are divided based on age categories: from 2 to 26 years of age (Varni 2020; Eprovide 2017).

RESEARCH OBJECTIVES

The first target was a comparison of the quality of life in children with autism spectrum disorders (henceforth ASD) with the quality of life in healthy children. The second target was a comparison of the quality of life in the families concerned with the quality of life in families with healthy children.

METHODS

The determination of the quality of life was implemented with the help of the PedsQL™ 4.0 questionnaire (Varni 2018). In the PedsQL™ 4.0 questionnaire, three scales are evaluated as follows: the score of the Physical Health, the score of the Psychosocial Health and the total score (Varni 2018). This questionnaire is completed by children as well as parents. In this way, it is possible to see separately what the consideration of the quality of life is in children and parents, or possibly whether there are differences between considerations of the quality of life in children and parents. The questionnaire PedsQL™ 4.0 comprises total of 23 questions, provided that in each question, the informant can acquire up to 100 points, and thus, the maximum score can be of 230 points, the minimum score is zero points. In the second questionnaire PedsQL™ 2.0 Family Impact Module (FIM), the situation in the family was evaluated by parents within the scale "quality of life as related to the health condition" (Health-Related Quality of Life, HRQL) within the scale Family Function and within the Total Score for the last month and for the last week (Varni 2020). We used both versions of the 2.0 Family Impact Module – for the last month and for the last week – the comparison of the two versions made it possible to search for possible differences or changes in the quality of life in the two periods. The two versions comprise total of 36 questions and thus, the highest

possible score of informants is of 360 and the lowest one is of 0.

Table 1. Classing of the sample group

	Number of children	Sex		Age (mean)
		Boy	Girl	
Children with ASD	15	8	7	9.53
Healthy children	15	8	7	11.7

(Source: own processing)

Total of 15 families with total of 15 children with ASD aged 2 to 18 years (see classing of the sample group, Table 1) participated in the research. From among 15 children with the health handicap, there were seven girls and eight boys. Healthy children exerted the same ratio - seven girls and eight boys. The average age in children with the health handicap was of 9.53 years. The average age in healthy children was of 11.7 years. The cooperating families were recruited by the Autis Centre, o.p.s., registering total of 26 families with children in this age range. Total of 60 questionnaires, i.e. 4 questionnaires in each family, were completed. The families with healthy children were also of 15 in number and they also completed 60 questionnaires. Each family completed 4 questionnaires – 2 PedsQL™ 4.0 questionnaires – one completed by the child and the second completed by the parent (in our case by the mother). The questionnaire PedsQL™ 2.0 is completed two times, one for the last 7 days and the second for the last month. After that, the questionnaires can be compared as to the question whether the quality of life is the same or different in the last week from that in the last month.

The questionnaires designed for the family were always completed by children mothers, since they spend more time with the children compared to the fathers. In the questionnaires, there is also a problem with completing the questionnaires by children. The children with autism had problems with understanding some questions. Thus, they were assisted by parents in completing the questionnaire – explanation of particular questions, which were not understood by the children.

The evaluation of PedsQL™ questionnaires was implemented depending on instructions by the authors. The average scores of respondents achieved were processed by non-parametric procedures – box plots and Mann-Whitney test (for independent samples) and Wilcoxon (paired comparison) test. The significance level (α) was chosen at 0.05 in all the tests.

The differences in the score achieved between the two groups of respondents (autistic and healthy children) were evaluated for both subscales as well as for the total score in each questionnaire. Thus, total of 12 tests were carried out (see Table 1). In all the comparisons, there was a highly significant difference in the quality of life between the groups of healthy children and autistic children.

RESULTS

As documented by graphs in Fig. 1, in the group of autistic children, a lower score, i.e. a worse quality of life was also recorded. The median of the Physical Health score in autistic children and in their parents was of 69 and 61 points, respectively, whereas in healthy respondents, the highest score of 100 points was achieved. The score of the Psychosocial Health had a median of 39 and 43 points in autistic children and in their parents, respectively; in the group of healthy individuals, the value was of 93 points in parents as well as children. The median of the Total Score of the quality of life PedsQL™ 4.0 exerted half values in the group of autistic children (48 points in children and 47 points in adults) compared to controls (95 points in both parents and children).

The evaluation of the PedsQL™ 2.0 FIM also confirmed considerable differences between parents of autistic and healthy children – in families with autistic children, median scores in particular scales were of 41 to 46 points; in healthy children the values were of 83 to 94 points (Figure 2).

The Wilcoxon paired test was used to compare differences between scores of children and their parents on PedsQL™ 4.0 scales, and the evaluation for the last months and for the last week by the questionnaire PedsQL™ 2.0 FIM also compared. In none of the cases, there was any statistically significant difference (see Table 3 and Figs. 1 and 2). Children and parents exert identical evaluation and the evaluation of the family situation for the last month also did not show differences from that for the last week

Table 2. Results of comparing the scores achieved in subgroups of autistic and healthy children monitored (Mann-Whitney test) (Source: author).

Questionnaire	Respondents	Scale	Significance (p)
PedsQL™ 4.0	Children	Score of physical health	< 0.001
		Score of psychosocial health	< 0.001
		Total score	< 0.001
	Parents	Score of physical health	< 0.001
		Score of psychosocial health	< 0.001
		Total score	< 0.001
PedsQL™ 2.0 FIM – last month	Parents	HRQL	< 0.001
		Family functioning	< 0.001
		Total score	< 0.001
PedsQL™ 2.0 FIM – last week	Parents	HRQL	< 0.001
		Family functioning	< 0.001
		Total score	< 0.001

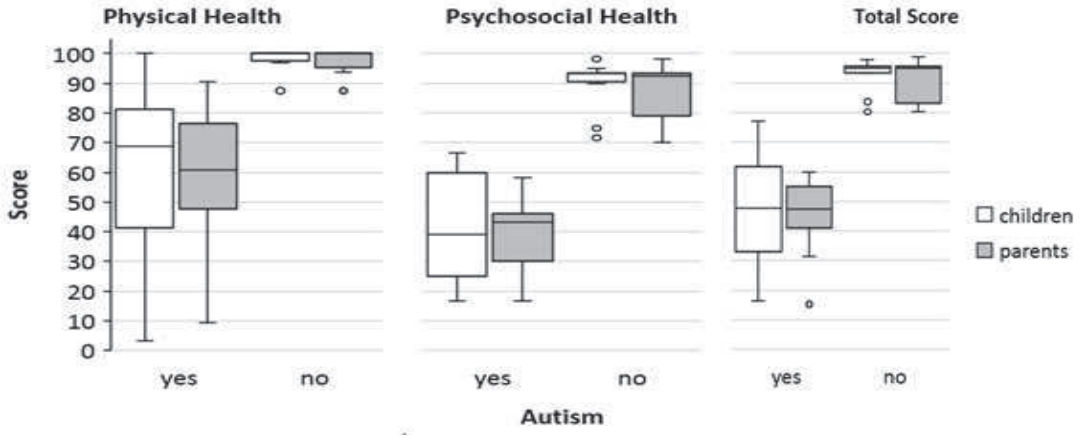

Figure 1. A box plot of score achieved in questionnaire PedsQL™ 4.0.

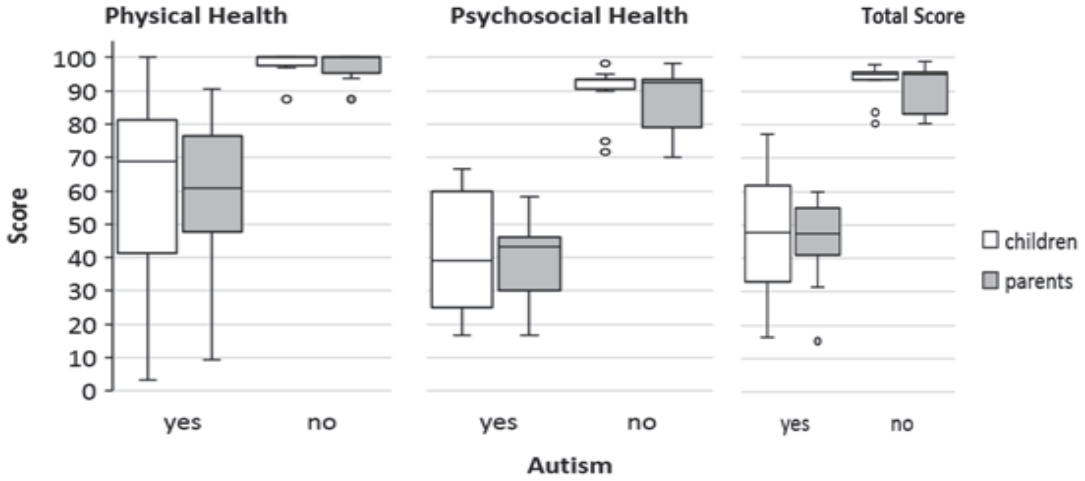

Figure 2. A box plot of scores achieved in PedsQL™ 2.0 FIM questionnaire.

Table 3. Results of paired comparisons of the evaluation of children and their parents on scales of the PedsQL™ 4.0 questionnaire and the evaluation of the family situation in the last month and last week in the PedsQL™ 2.0 FIM questionnaire (Wilcoxon test). (Source: author)

Group	Questionnaire - comparison	Scale	Significance (p)
Autistic children	PedsQL™ 4.0 – children vs. parents	Score of physical health	0.372
		Score of psychosocial health	0.592
		Total score	0.412
	PedsQL™ 2.0 FIM – month vs. week	HRQL	0.697
		Family functioning	0.910
		Total score	0.813
Health	PedsQL™ 4.0 – children vs. parents	Score of physical health	0.500
		Score of psychosocial health	0.297
		Total score	0.227
	PedsQL™ 2.0 FIM – month vs. week	HRQL	0.919
		Family functioning	0.250
		Total score	0.556

DISCUSSION

There is an ever growing interest in problems of autism and of the whole ASD with respect to needs of parents, social and second-opinion professionals. One of possibilities to objectivize needs of these children is the evaluation of their quality of life (Baloun, Velemínský 2019). The authors dealt with these problems for long period of time and they have published several works concerning this topics. For this purpose, they employed questionnaires PedsQL™ 4.0 and the evaluation of the family situation for the last month and for the last week with the use of the questionnaire PedsQL™ 2.0 (Baloun, Velemínský 2018). These questionnaires are preferred, since they are focussed not only on children, but also on problems of the whole family. They monitor the quality of life and are recommended by a number of important specialists in this field (Baloun, Velemínský 2019a). However, it is easy to understand that these questionnaires do not cover all the problems of the life and that the evaluation of the quality of life in these children calls for individual approaches (Baloun, Velemínský, Dvořáčková 2019). It was possible to assume that results of these comparisons will be similar. The quality of life shows considerable differences between children with ASD and healthy children. The same results also demonstrated a study by the authors Du, Yui and King (2019). There are surprisingly deep differences. It is thus necessary to support families with autistic children, including for example activities of the type of shared care - Homesharing. These are regular, alleviating stays in hosts helping families with autistic children to restart their capacity. The host family or individual regularly takes the child in care for an agreed period of time. They spend time mutually, participate in trips, take lunch and play. In the evening, the child returns back home. There is an important role of different organizations as for example National Institute for Autism, z.ú. (abbreviated as NAUTIS) **which is a non-governmental non-profit organization** with its legislative form of an institution offering wide services to people with autism and people around them – i.e. parents, brothers and sisters, schoolmates, teachers, physicians and further specialists (Nautis 2020). It is to remind the fact that in the prognosis concerning children with autism, the timely diagnosis is frequently of decisive importance. This is particularly supported by a systematic screening of ASD in toddlers.

PedsQL™ 4.0 was simultaneously completed by parents and children with ASD. All age categories were considered. We searched for differences between opinions aimed at the quality of life in children and their parents and found no statistically significant difference, i.e. parents consider the quality of life in the same way as the child. This concept is refused by Stokes *et al.* (2016), who report different

considerations of the quality of life between adults and their children or adolescents. In their research, the parents exerted different reactions.

With the help of the questionnaire PedsQL™ 2.0, we investigated the quality of life for the last 7 days and for the last month. We found no statistically significant differences between the two periods. Eslami et al. (2018) also did not found any statistically significant difference between the two periods. They also did not found any statistically significant difference between children with ASD and healthy children serving as controls.

The present research was limited by the number of families and children with ASD monitored. The study was implemented only in one cooperating centre, which had not very numerous respondents in the given age category.

CONCLUSION

PedsQL™ 4.0 questionnaires demonstrated considerable differences in the quality of life between children with autism and healthy children. The PedsQL™ 2.0 questionnaire was completed in two versions – in one version, the quality of life was evaluated for the last week and the second version of the questionnaire was evaluated with taking into account the last month. Both questionnaires demonstrated considerable differences in the quality of life in families with autistic children compared to families having healthy children. There was contrastingly no statistically significant difference between versions for the last week and for the last month in families with autism or in families with healthy children.

The questionnaires PedsQL™ 4.0 as well as PedsQL™ 2.0 are applicable worldwide. Within the framework of the present research, we confirmed the applicability of these questionnaires in the Czech Republic, too.

Under Czech conditions, the questionnaires could also be used for measurements of the quality of life within the framework of using social and healthcare services, where it could be possible to measure how the given service affects the quality of life – whether the quality of life was improved, unaltered or deteriorated thanks to the particular service.

The completion of PedsQL ™ 4.0 questionnaire was rather difficult in autistic children, who encountered problems with understanding certain questions or who were not able to independently complete the questionnaire at all. We will furthermore study the applicability in a larger sample group to find the capability of completing the questionnaires in children with autism or possibly to determine whether the problem depends on the type of the ASD.

The scientific contribution inheres in the verification of the possibility of using these questionnaires, provided that the quality of this activity should be enhanced.

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Slovenská komora sociálnych pracovníkov a asistentov sociálnej práce

St. Elizabeth University of Health and Social Work in Bratislava, Slovak Republic
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Venue: Ośrodek Rehabilitacyjno-Wypoczynkowy „Muflon" 43-450 Ustroń – Zawodzie ul. Sanatoryjna 32

The aim of the conference is to broaden collaboration in healthcare, nursing, social work and helping professions in the 21st century.

Conference topics:
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Active participants are welcome in the plenary, panel or poster sections.
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Poster size: 120 cm x 90 cm (portrait); discussion in poster section will be facilitated by a moderator.

If the unfavorable epidemiological situation caused by COVID-19 pandemics will persist, the conference will be organized in the distant dorm as videoconference or online conference

Abstracts of conference papers and posters presented at the conference will be publihed on CD-ROM, as the Supplementum of the scholarly journal *Zdravotníctvo a sociálna práca* (*Health and Social* Work*) No* 4 / 2020 (in domestic language of authors and in English).
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