



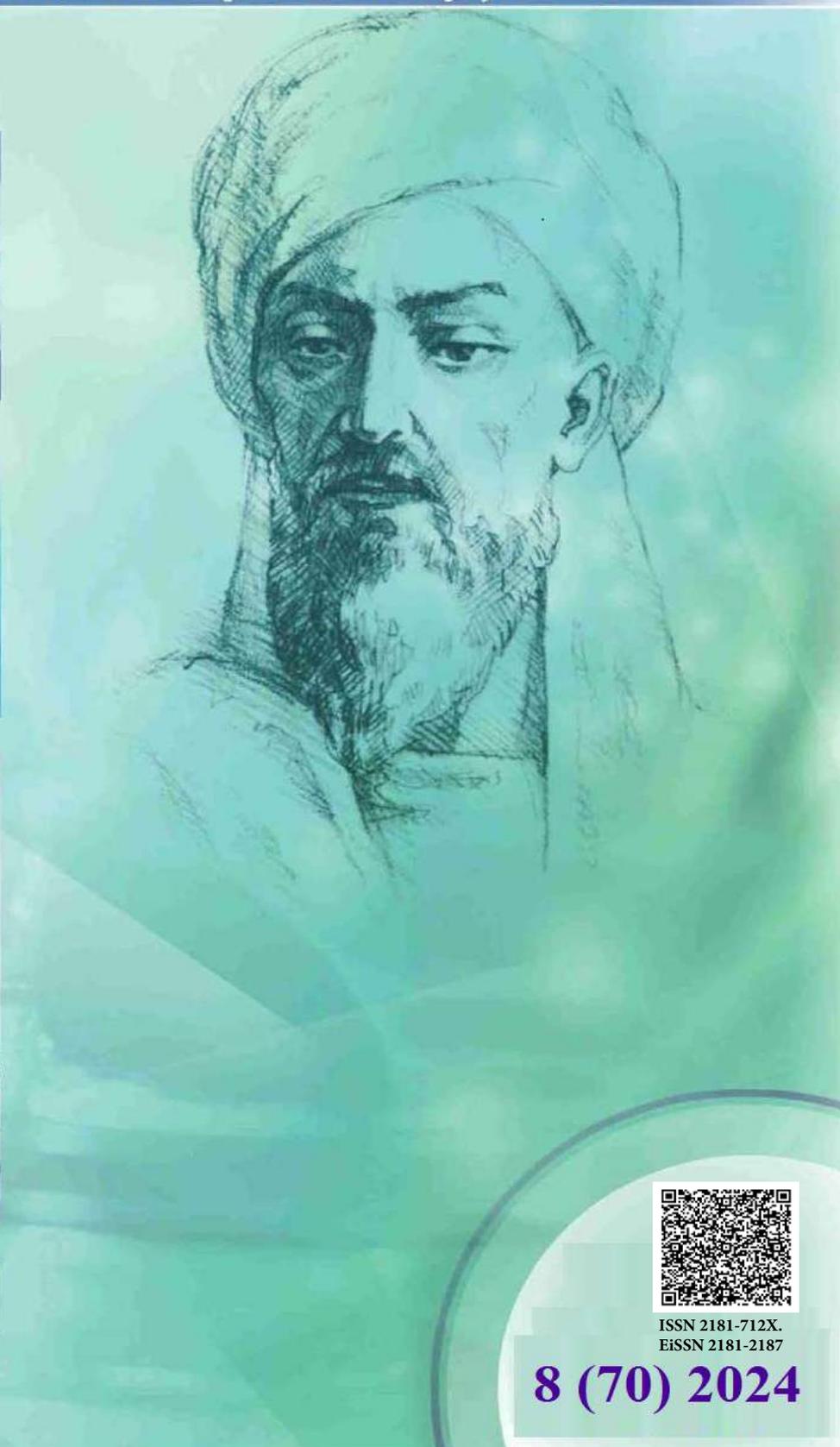
New Day in Medicine
Новый День в Медицине

NDM



TIBBIYOTDA YANGI KUN

Ilmiy referativ, marifiy-ma'naviy jurnal



AVICENNA-MED.UZ



ISSN 2181-712X.
EiSSN 2181-2187

8 (70) 2024

Сопредседатели редакционной коллегии:

**Ш. Ж. ТЕШАЕВ,
А. Ш. РЕВИШВИЛИ**

Ред. коллегия:

М.И. АБДУЛЛАЕВ
А.А. АБДУМАЖИДОВ
Р.Б. АБДУЛЛАЕВ
Л.М. АБДУЛЛАЕВА
А.Ш. АБДУМАЖИДОВ
М.А. АБДУЛЛАЕВА
Х.А. АБДУМАЖИДОВ
Б.З. АБДУСАМАТОВ
М.М. АКБАРОВ
Х.А. АКИЛОВ
М.М. АЛИЕВ
С.Ж. АМИНОВ
Ш.Э. АМОНОВ
Ш.М. АХМЕДОВ
Ю.М. АХМЕДОВ
С.М. АХМЕДОВА
Т.А. АСКАРОВ
М.А. АРТИКОВА
Ж.Б. БЕКНАЗАРОВ (главный редактор)
Е.А. БЕРДИЕВ
Б.Т. БУЗРУКОВ
Р.К. ДАДАБАЕВА
М.Н. ДАМИНОВА
К.А. ДЕХКОНОВ
Э.С. ДЖУМАБАЕВ
А.А. ДЖАЛИЛОВ
Н.Н. ЗОЛотова
А.Ш. ИНОЯТОВ
С. ИНДАМИНОВ
А.И. ИСКАНДАРОВ
А.С. ИЛЬЯСОВ
Э.Э. КОБИЛОВ
А.М. МАННАНОВ
Д.М. МУСАЕВА
Т.С. МУСАЕВ
М.Р. МИРЗОЕВА
Ф.Г. НАЗИРОВ
Н.А. НУРАЛИЕВА
Ф.С. ОРИПОВ
Б.Т. РАХИМОВ
Х.А. РАСУЛОВ
Ш.И. РУЗИЕВ
С.А. РУЗИБОВЕВ
С.А.ГАФФОРОВ
С.Т. ШАТМАНОВ (Кыргызстан)
Ж.Б. САТТАРОВ
Б.Б. САФОВЕВ (отв. редактор)
И.А. САТИВАЛДИЕВА
Ш.Т. САЛИМОВ
Д.И. ТУКСАНОВА
М.М. ТАДЖИЕВ
А.Ж. ХАМРАЕВ
Д.А. ХАСАНОВА
А.М. ШАМСИЕВ
А.К. ШАДМАНОВ
Н.Ж. ЭРМАТОВ
Б.Б. ЕРГАШЕВ
Н.Ш. ЕРГАШЕВ
И.Р. ЮЛДАШЕВ
Д.Х. ЮЛДАШЕВА
А.С. ЮСУПОВ
Ш.Ш. ЯРИКУЛОВ
М.Ш. ХАКИМОВ
Д.О. ИВАНОВ (Россия)
К.А. ЕГЕЗАРЯН (Россия)
DONG JINCHENG (Китай)
КУЗАКОВ В.Е. (Россия)
Я. МЕЙЕРНИК (Словакия)
В.А. МИТИШ (Россия)
В.И. ПРИМАКОВ (Беларусь)
О.В. ПЕШИКОВ (Россия)
А.А. ПОТАПОВ (Россия)
А.А. ТЕПЛОВ (Россия)
Т.Ш. ШАРМАНОВ (Казахстан)
А.А. ЩЕГОЛОВ (Россия)
Prof. Dr. KURBANHAN MUSLUMOV (Azerbaijan)
Prof. Dr. DENIZ UYAK (Germany)

**ТИББИЁТДА ЯНГИ КУН
НОВЫЙ ДЕНЬ В МЕДИЦИНЕ
NEW DAY IN MEDICINE**

*Илмий-рефератив, маънавий-маърифий журнал
Научно-реферативный,
духовно-просветительский журнал*

УЧРЕДИТЕЛИ:

**БУХАРСКИЙ ГОСУДАРСТВЕННЫЙ
МЕДИЦИНСКИЙ ИНСТИТУТ
ООО «ТИББИЁТДА ЯНГИ КУН»**

Национальный медицинский
исследовательский центр хирургии имени
А.В. Вишневского является генеральным
научно-практическим
консультантом редакции

Журнал был включен в список журнальных
изданий, рецензируемых Высшей
Аттестационной Комиссией
Республики Узбекистан
(Протокол № 201/03 от 30.12.2013 г.)

РЕДАКЦИОННЫЙ СОВЕТ:

М.М. АБДУРАХМАНОВ (Бухара)
Г.Ж. ЖАРЫЛКАСЫНОВА (Бухара)
А.Ш. ИНОЯТОВ (Ташкент)
Г.А. ИХТИЁРОВА (Бухара)
Ш.И. КАРИМОВ (Ташкент)
У.К. КАЮМОВ (Тошкент)
Ш.И. НАВРУЗОВА (Бухара)
А.А. НОСИРОВ (Ташкент)
А.Р. ОБЛОКУЛОВ (Бухара)
Б.Т. ОДИЛОВА (Ташкент)
Ш.Т. УРАКОВ (Бухара)

8 (70)

2024

август

www.bsmi.uz

https://newdaymedicine.com E:

ndmuz@mail.ru

Тел: +99890 8061882

Received: 20.07.2024, Accepted: 02.08.2024, Published: 10.08.2024

UDK 616:76.2/109.-1224

**ANALYSES OF RESULTS RADIOLOGICAL EXAMINATION NEUROLOGICAL
DIAGNOSTICS IN PATHOLOGICAL CONDITIONS OF PATIENTS WITH PAIN IN THE
LUMBAR REGION**

Davranov I.I. <https://orcid.org/0009-0002-3349-293X>
Xamroqulov J.D. <https://orcid.org/4567-0098-8788-1223>

Samarkand State Medical University Uzbekistan, Samarkand, st. Amir Temur,
Tel: +99818 66 2330841 E-mail: sammi@sammi.uz

✓ *Resume*

Currently, not enough is known about the different trajectories and exact timing of the onset or progression of chronic pain. This is in stark contrast to earlier conventional wisdom that back pain would spontaneously decrease over time. Many authors have shown that degenerative changes in the lumbar spine detected by magnetic resonance imaging (MRI) do not correlate with pain intensity and do not predict the neuropathic component of back pain, necessitating the search for new diagnostic approaches to this problem.

Keywords: Lumbar pain, neurological tests, spine, MRI

**BEL OG'RIG'I BO'LGAN BEMORLARNING PATOLOGIK HOLATLARIDA
NEUROLOGIK DIAGNOSTIKANING RADIATSION DIAGNOSTIKASI NATIJALARINI
TAHLILILI**

Davranov I.I. <https://orcid.org/0009-0002-3349-293X>
Xamroqulov J.D. <https://orcid.org/4567-0098-8788-1223>

Samarqand davlat tibbiyot universiteti O'zbekiston, Samarqand, st. Amir Temur,
Tel: +99818 66 2330841 E-mail: sammi@sammi.uz

✓ *Rezyme*

Hozirgi vaqtda surunkali og'riqning paydo bo'lishi yoki rivojlanishining turli traektoriyalari va aniq vaqtlari haqida yetarli ma'lumot yo'q. Bu bel og'rig'i vaqt o'tishi bilan o'z-o'zidan kamayadi degan oldingi an'anaviy tushunchalardan keskin farq qiladi. Ko'pgina mualliflar bel umurtqasidagi magnit-rezonans tomografiya (MRT) natijasida aniqlangan degenerativ o'zgarishlar og'riq intensivligi bilan bog'liq emasligini va bel og'rig'ining neyropatik komponentini bashorat qilmasligini ko'rsatishdi, bu esa ushbu muammoga yangi diagnostik yondashuvlarni izlashni talab qiladi.

Kalit so'zlar: bel og'rig'i, nevrologik testlar, umurtqa pog'onasi, MRT

**АНАЛИЗ РЕЗУЛЬТАТОВ ОБСЛЕДОВАНИЯ ЛУЧЕВОЙ ДИАГНОСТИКИ
НЕВРОЛОГИЧЕСКОЙ ДИАГНОСТИКИ ПРИ ПАТОЛОГИЧЕСКИХ СОСТОЯНИЯХ
БОЛЬНЫХ С БОЛЯМИ В ПОЯСНИЦЕ**

Давронов И.И. <https://orcid.org/0009-0002-3349-293X>
Хамрокулов Ж.Д. <https://orcid.org/4567-0098-8788-1223>

Самаркандский государственный медицинский университет Узбекистан, г. Самарканд,
ул. Амира Темура, Тел: +99818 66 2330841 E-mail: sammi@sammi.uz

✓ **Резюме**

В настоящее время недостаточно известно о различных траекториях и точных сроках возникновения или развития хронической боли. Это резко контрастирует с более ранними традиционными представлениями о том, что боль в спине будет спонтанно уменьшаться с течением времени. Многими авторами показано, что выявленные по результатам магнитно-резонансной томографии (МРТ) дегенеративные изменения в поясничном отделе позвоночника, не коррелируют с интенсивностью боли и не предсказывают нейропатический компонент боли в спине, что требует поиска новых диагностических подходов к данной проблеме.

Ключевые слова: Поясничная боль, неврологические тесты, позвоночник, МРТ

Relevance

The problem of low back pain syndrome (LBPS) is caused by the wide prevalence of this pathology, the duration of periods of disability, high material costs of rehabilitation, a large polymorphism of clinical manifestations, a small number of treatment and diagnostic methods with a reasonable evidence base. Episodes of back pain occur during life in 50-99% of the population; the peak of prevalence and morbidity is in the working age. The lumbosacral spine is affected in up to 60-80%, which is due to the peculiarities of biomechanics and increased load on this spine. Currently, not enough is known about the different trajectories and exact timing of the onset or development of chronic pain. This is in stark contrast to earlier traditional beliefs that back pain will spontaneously decrease over time [1,9]. Many authors have shown that degenerative changes in the lumbar spine detected by magnetic resonance imaging (MRI) do not correlate with pain intensity and do not predict the neuropathic component of back pain, necessitating the search for new diagnostic approaches to this problem [2,10]. The prevalence of low back pain is high among young adults (graded by WHO, 18 to 44 years), the prevalence of low back pain during the year in the adult population ranges from 22 to 65%, with a 1.5-fold increase in the absolute number of persons suffering from BSNS over the last 27 years. The maximum frequency of cases occurs in the second half of life, starting from 40 years of age, with no significant difference among genders. The search for predictors of back pain development and prediction of its chronic course in different groups of young able-bodied population seeking therapeutic help is an urgent issue [12,13]. The role of various factors in the transformation of acute BNS into chronic BNS has been discussed in the literature. There are also few studies of risk factors of MPD degeneration in young and old age, chronicisation of back pain, the pathophysiological mechanisms of DBP progression in young people, structural and anatomical interrelationships have not been definitively determined, and criteria for differentiating DBP from the age-dependent process of tissue aging have not been developed. Disclosure of pathogenesis of dorsopathy occurrence will allow clinicians to correctly interpret MR-tomographic, MSCT data, additional instrumental methods and laboratory methods of research, which will allow to reduce the incidence, prevalence and duration of disability at early stages to a great extent, besides, patients need careful differentiation of diseases, both with diseases of internal organs and deforming diseases. In the last two decades, the wide and effective introduction of new technologies of radial diagnostics into the clinic has redefined their role in the diagnostic algorithm of disease recognition. It is known that in spinal lesions, changes in soft tissues, which are available for detailed visualisation only with the help of MRI or MSCT, are primary. However, this kind of work in the Russian literature is presented only in the form of single publications, and the accumulated data have not been systematised and generalised [3,11]. Therefore, radial imaging of patients with BSNS does not have a clear definition of the optimal research technique, and there is no unified position of researchers in the interpretation of the visualised structures. Due to the variety of applied radial methods of lumbosacral examination, there is a need to clarify their diagnostic value, to develop unified protocols of research, and to analyse diagnostic errors. For early and rational diagnostics of these changes, it is necessary to develop an optimal algorithm of radial diagnostics, which will improve the quality and reduce the number of investigations [5,8]. In turn, the maximum possible early detection of degenerative disorders will contribute to the timely initiation of treatment and improvement of its outcomes. All of the abovementioned factors have highlighted the relevance of this work and determined the purpose of the study [4,7].

Purpose of the study: Analyses of results radiodiagnostic examination neurological diagnostics in pathological conditions of patients with pain in the lumbar region

Materials and methods

Before proceeding to the evaluation of the possibilities of neuroimaging methods of research and solution of the set tasks it was necessary to determine the contingent of patients for the study and divide into groups at the first stage (according to the selection criteria). During the period 2021-2024, 4628 patients applied to the Department of X-ray Radiology of the Multidisciplinary Clinic of Samarkand State Medical University, either independently or by referral of neurologist, neurosurgeon, rheumatologist, oncologist and other specialists. Of these, 2518 patients underwent MSCT diagnostics and 2110 patients underwent MRI diagnostics of the lumbosacral spine. Out of the total number of patients referred to MSCT - women 1625, men 893; MRI - women 1335, men 775. As can be seen, women's treatment is twice as much as neuroimaging diagnostics. The age trend was also not unambiguous: patients from 20 to 30 years old were 30% in the MSCT study, from 30 to 60 years old 62%, over 60 years old 8%; in the MRI study the patients of young age (20-30 years old) were 30%, from 30 to 60 years old 58%, over 60 years old 12%; as can be seen, practically the age features between the two studies were identical, where the greater percentage of diagnostic procedures fell on the age from 30 to 60 years old.

All patients presented complaints of acute or chronic back pain, which was the main component for the indication of lumbosacral neuroimaging, as patients indicated pain in this area. In addition, 200 patients constituted a separate group of retrospective nature (comparison group), who had previously undergone CT scan of the lumbosacral region or digital radiological examination (of the same region). These data were used in the paper as a comparison of outcomes. An important component of the first stage was the selection of patients for the main study and the analysis of the study results. In accordance with this, the inclusion criteria of the patients were determined.

Result and discussions

On the basis of dynamic clinical and neurological examination at the first stage with a detailed review of the anamnesis, with the result of primary neuroimaging and in accordance with the set goal and objectives 169 patients of the main group (cohort) (OG) of patients were selected for the further stage of the study; 42 patients were selected for comparison in the comparison group (CG), this category with the data (retrospective analysis) of previously conducted studies (CT and radiography). The control group (GC) consisted of 42 (volunteers) healthy, without pain in the lower back, the origin of the study was carried out for the purity of analysis of diagnostic methods, this group was identical in age and sex with the main group (cohort) of patients.

At the second stage the patients were questioned using a questionnaire compiled (arbitrarily in accordance with the basic protocol) at the Department of Neurology of SamSMU including questions according to the basic complaint. 'Duration of pain syndrome? Duration of pain - episodes? What was the provocateur of pain? etc.'. The duration of low back pain varied in the examined patients of the main and comparison group from 2 to 20 years. On the basis of questionnaires we studied the factors leading to exacerbation of back pain: duration of work in a sitting position (at the computer); heavy work (lifting weights), physical (sports) activity, hereditary predisposition (back pain among the first line relatives), exacerbation against the background of a previous neuroinfection, dieting (sharp weight loss) or on the contrary sharp weight gain (obesity). Patients at the second stage underwent clinical and neurological examination, examination by a neurosurgeon (if necessary).

An important component at the time of examination of patients was to determine the strength of pain symptom intensity. The result of the assessment was determined using a standard visual analogue scale. VAS (0-10 points), a scale - McGill questionnaire, capable of determining the level of pain by descriptive signs. In addition, the indicators of disability were taken into account; for this purpose, the Waddell questionnaire was used. Taking into account the limitation of body weight for MRI (MSCT) diagnostics, the principles of weight analysis were observed; by BMI index (where body weight in kg divided by height in m); in the category of spine patients (scoliosis, stooping). Thus, using the Adams test, we determined the signs of scoliosis caused by inappropriate posture, during the educational process, overuse of gadgets. Scoliosis scoliosis, according to international standards, is classified into types according to its peculiarities of structure and convexity of the thorax order to assess and determine the limited mobility in the spine, a study was carried out using the Tomeyer and Schober tests, which differ in that, when leaning forward, the distance from 'straight standing' to leaning, in the norm corresponds to 15 cm. In the questionnaire, the questions concerning the earlier stages of diagnosis and

treatment (conservative treatment for back pain: radiculopathy, dorsopathy of lumbosacral localisation) were used.

To assess the nature of pain in the lower back, with correlation of the quality of life level, we used the Roland questionnaire, which is a part of the standard diagnostic study of patients with back pain of American scientists, where 7 points and higher is considered to be a violation of the patient's life activity.

Within the framework of the study we used the algorithm of examination of patients with low back pain syndrome.

In addition to dynamic MSCT and MRI within the specified time intervals, repeat examinations outside the specified time frames (if necessary) were performed according to clinical indications.

MSCT and MRI data were analysed to identify the following signs: 1. Vertebral body destruction, 1.1 marginal (lacunar) destruction at the level of adjacent vertebral body surfaces or one of the vertebrae, 1.2. 1/3 destruction of adjacent vertebral body surfaces, 1.3. 2/3 destruction of adjacent vertebral body surfaces, 1.4. >2/3 destruction of adjacent vertebral body surfaces. 2. Sclerosing of the adjacent surfaces of the vertebral bodies at the level of destruction. 3. Arthritis and destruction at the intervertebral joints. 4. Perineural oedema (swelling of fatty tissue along the nerve roots at the level of the intervertebral foramen). 5. Edema of the intervertebral disc. 6. Destruction of the intervertebral disc. 7. Compression of the spinal cord and its sheaths, or compression of the spinal sheaths (depending on the level of spinal cord damage by the purulent-inflammatory process). 8. Constriction of the spinal canal,

The data obtained and analysed taking into account the revealed radial semiotics were compared with each other to obtain a holistic picture and further compared with the data of neurological symptomatology.

Multi-Spiral Computed Tomography (MSCT).

Multi-slice computed tomography was performed on certified Ingenuity CT 128 and Brilliance CT6 equipment using standard techniques.

Minimum table pitch 1 mm, minimum slice thickness 2 mm, possible gentry angles from -22° to $+19^{\circ}$. The time of performing one slice is 3-5 sec.

Intervertebral discs were studied according to the standard technique with subsequent reconstructions and different methods of processing: changes in the width and centre of the window, as well as the use of different filters. The lumbar spine was scanned at KV - 130, sec/m As - 5.0/350, 5.0/500, slice thickness 3 mm, step 3 mm, and if necessary, the step and slice thickness were reduced to 2 mm.

Patients were in the supine position, and the lordosis of the lumbar spine was reduced using a special roller placed under the knees.

The angle of the gentry apparatus was determined after the topogram according to the location of the intervertebral discs so that the collimated X-ray beam passed parallel to the intervertebral disc. This improves visualisation of the disc and avoids artefacts caused by bony structures and calcifications.

The examination was started with a lateral topogram, which was used to determine the area of interest and the angles of the gentry. Tomograms of the intervertebral discs were performed with mandatory capture of the intervertebral foramen, the entire disc, and the closure plate of the underlying vertebra. In case of downward migration of herniated disc sequestrations, the study was continued until the sequestrum disappeared.

The number of slices per intervertebral disc was 10-15 depending on its height.

The obtained data were analysed with changes in the centre and width of the window, as well as the application of different filters (AB-2 to AB-9). Densitometric indices were measured (disc absorption coefficient (AC) $+70 - +82$ HU (Hounsfield units), pulposus nucleus $+40 - +60$ Hu).

The spinal canal was measured from the soft tissue contours. Intervertebral disc herniation indices were determined by location, shape, structure and extent in the spinal canal.

The obtained images were reconstructed in the horizontal and vertical planes.

Magnetic resonance imaging

Magnetic resonance imaging was performed on an Exelart Vantage MR tomograph, Toshiba company, with a magnetic field induction of 1.5 Tesla. A 4-channel spinal coil included in the set of the tomograph was used for the study. The standard study protocol used was: - sagittal T1 spin-echo T1-VI projections (TR/TE (ms), 350-650/ 11-30); - sagittal, coronal and axial fast spin-echo T2-VI projections (TR/TE (ms), 3,000-4,000/76-108); - sagittal, coronal, and axial T1-VI projections with suppression of MR signal from adipose tissue (TR/TE (ms), 350-800/11-30), after administration of gadolinium-based

contrast agent at the rate of 0.2 ml/kg - STIR IP (short time inversion recovery).

The assessment of the intervertebral disc condition was studied according to MRI variants standardised by D.Schlenska et al:

M-0 - normal: spherical or ovoid shaped pulposus nucleus;

M-1 - scar changes in the disc, deformation of the pulp nucleus, local (segmental) decrease in the degree of luminescence;

M-2 - disc degeneration - disappearance of pulp nucleus luminescence.

When describing the types of MPD changes depending on the preservation or violation of the integrity of the fibrous ring, we used the following classification

disc bulging, when there is symmetrical bulging of the fibrous ring beyond the posterior surfaces of the vertebral bodies, combined with degenerative changes in the disc tissue;

disc protrusion (prolapse) - local protrusion of the nucleus pulposus due to thinning of the fibrous ring (without rupture) beyond the posterior edge of the vertebral bodies;

disc herniation (or disc extrusion), a herniation of the nucleus pulposus content outside the fibrous ring due to its rupture; disc herniation with sequestration (the prolapsed part of the disc is located in the epidural space in the form of a free fragment).

We studied the condition of vertebral bodies associated with degenerative processes in the disc in accordance with Modic's, (1988) classification.

Type 1 is characterised by decreased signal intensity on T1- and increased signal intensity on T2-weighted images, indicating inflammatory processes in the vertebral bone marrow;

Type 2 is characterised by increased signal intensity on T1- and T2-weighted images, indicating replacement of normal bone marrow by fatty tissue.

Type 3 is characterised by a decrease in signal intensity on T1 and T2-weighted images, indicating osteosclerosis processes. The condition of the vertebral body closure plates, the presence of Schmorl's nodes (intravertebral hernias), the presence of osteophytes (anterior, lateral, posterior), arthrosis of the arch joints, congenital spinal anomalies and neural involvement were also studied

The result of the score on this questionnaire (ODI), showed the level of low score on the patients' vital signs. The worst indicators were in patients of the 2nd subgroup (30-60 years), the second level of low indicators were elderly patients of the 3rd subgroup (60-75 years), relatively favourable level on the quality of life activities were patients of young age - 1st subgroup (20-30 years), where the 2nd and 3rd subgroups corresponded to comparability $52\pm 3.5\%$ and $48\pm 4\%$ ($p=0.05$); in the 1st subgroup patients, despite back pain, tried not to limit their life, in everyday activities ($p=0.01$). In the total sample it can be noted that among the patients of the three groups high (persistent) limitation was observed in 33.3% of cases, pronounced (less persistent) in 40% of patients, medium limitation in 13% of patients in the main cohort of patients. The analysis of the pain syndrome in the lower back (lumbosacral region) was evaluated differently by the patients, according to the ODI questionnaire, in the 2nd subgroup this index corresponded to $3,1\pm 0,15$ points; in the 3rd subgroup $3\pm 0,05$ points, where $p=0,05$; in the 1st subgroup $2,99\pm 0,12$ points; all these figures respectively confirm the low level of various nuances of the patients' life activity. At detailed consideration of the sphere of vital activity, the increase of pain syndrome in the elderly was associated with simple household self-care: morning rising, washing (brushing teeth, combing), dressing, making beds, etc. In the 2nd subgroup - pain intensification, when changing the position of the body (sit - stand), with difficulty sitting down at the wheel of the car or in the car cabin, statistical load or load when walking; in the 1st subgroup - patients of young age, experienced pain intensification at physical load (gym), at long displacement of legs lectures (classes).

Conclusions

Thus, the pain syndrome was associated with the patients' occupation, statistical overstrain, heavy lifting, stereotypical movement during work, all this eventually leads to back pain due to fracture in the lumbosacral region, having studied the peculiarities of the clinical and neurological picture of the patients of the main cohort, it is possible to assert the combination. Patients note the severity of pain syndrome, with muscle tension in the lumbosacral level; changes in posture (scoliosis), the presence of several types of tension symptoms (Laseg, Neri-Linder, Bragard, 'bow'), with particular brightness on the side of radicular pain. Distinctive signs in groups (by age) are noted, in the group of young people subjective indicators do not correspond to objective ones, prevail; in the 2nd subgroup gross neurological (focal) changes are noted, in the 3rd subgroup, smearing of clinical signs, with accession

of vegeto-trophic disorders, poly symptomatology; no clear painfulness on palpation (localisation is not defined on one point, due to irradiation), at the same time in the 1st and 2nd subgroups palpatory changes of pain syndrome (pain intensification) were the most frequent.

LIST OF REFERENCES:

1. Волель Б.А., Петелин Д.С., Рожков Д.О. Хроническая боль в спине и психические расстройства. //Неврология, нейропсихиатрия, психосоматика. 2019;11(Прил. 2):17-24.
2. Chaabeni A., Kalai A., Megdiche I., Migaou H., Jellad A. and Frih Z.B.S. Prevalence and Associated Factors of Low Back Pain among Adolescent Athletes from an Athletics Club: A Cross-Sectional Study. //Open Access Library Journal, 2023;10(2):1-7. doi: 10.4236/oalib.1109722.
3. Jeffries L.J., Milanese S.F., Grimmer-Somers K.A. Epidemiology of adolescent spinal pain: a systematic overview of the research literature. //Spine (Phila Pa 1976). 2007;32(23):2630-2637. doi:10.1097/BRS.0b013e318158d70b
4. Буриева Д.М., Хакимова С.З., Джурабекова А.Т. Сравнительное изучение функции поддержания вертикальной позы у здоровых лиц и больных с паркинсонизмом //Инновационная наука. 2015;6(2):232-236.
5. Шмырина К.В., Джурабекова А.Т., Вязикова Н.Ф. Эффективность Миртазапина в комплексном лечении хронических вертеброгенных болей в спине, обусловленных остеохондрозом позвоночника //Российский журнал боли. 2015;1:71-72.
6. Шмырина К.В., Джурабекова А.Т., Вязикова Н.Ф., Бекназаров Н.Н. Оптимизация лечения остеохондроза пояснично-крестцового отдела позвоночника //Medicine (Almaty). 2016;7(169):62-66.
7. Косарев В.В., Бабанов С.А. Хроническая пояснично-крестцовая радикулопатия: современное понимание и особенности фармакотерапии. //РМЖ. 2013;16:844.
8. Жезлов М.М. Левин О.С. Диагностика и лечение вертеброгенной пояснично-крестцовой радикулопатии //Журнал Современная терапия в психиатрии и неврологии, 2012;4:31-36.
9. Berry J.A., Elia C., Saini H.S., et al. A review of lumbar radiculopathy, diagnosis, and treatment. //Cureus, 2019;11(10): e5934. doi:10.7759/cureus.5934
10. So J.S., Kim Y.J., Lee S.K., Cho C.S. Importance of differential diagnosis of a possible brain tumor in patients with cervical radiculopathy. //J Korean Neurosurg Soc. 2022;65(1):145-150. doi:10.3340/jkns.2021.0127
11. Lin J.H., Chen C.C. Current challenges in diagnosis of lumbar radiculopathy. //World J Anesthesiol, 2018;7(3):20-23.
12. Котова О.В., Акарачкова Е.С. Боль в спине: эпидемиология, этиология, лечение. //Consilium Medicum. 2017;19(2.3. Неврология и Ревматология):43-47.
13. Renjith K.R., Shetty A.P., Kanna P.R.M., Rajasekaran S. Spinal melorheostosis: a rare cause for thoracic radiculopathy. //Int J Spine Surg. 2020;14(2):209-212. Published 2020 Apr 30. doi:10.14444/7027

Entered 20.07.2024