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"CHARACTERISTICS OF ILLNESS COURSE IN PATIENTS WITH SPINAL CORD STROKE WITH RISK FACTORS."

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Increased rates of permanent neurological deficits in the high-level neurological emergency of spinal cord infarction. It's a rare but treatable condition that aims to expand. And it is aimed at assessing the role of risk factors in its occurrence.

Materials and methods. Description of the features of spontaneous spinal cord infarction (SBI) in large retrospective series. Data on spontaneous spinal cord infarction in patients treated in the neurology departments of the clinical hospital of the Samarkand branch of the RSCEMC. Conducting a descriptive and comparative analysis of the spontaneous spinal cord stroke we treated between 2015 and 2025 at the Samarkand branch of the RSCEMC. Analysis of pre-hospitalization and inpatient procedures, assessment of clinical manifestations, etiology, diagnostic accuracy, functional results of reperfusion therapy.

Results: As a result of the research, 54 cases were identified, 63% of cases were identified in the second half of the study period. The average age was 63.5 years [interquartile range (IQR) = 56-74], 52.1% of these patients were women. The main syndrome of anterior spinal artery infarction (82.9%). The degree of etiology and diagnostic accuracy of atherosclerosis in patients with pronounced OMI (48%) and unknown atherosclerosis (52%) in the 1st clinic of SamSMU and in the city hospitals of Samarkand, respectively. Patients arrived in the emergency department on average after 264.5 minutes. The first magnetic resonance imaging (MRI) of the spinal cord was performed on average 148 minutes after administration, and in 45% of cases, the diagnosis of AMI was detected. Two patients underwent intravenous thrombolysis (2.2%).

Summary: Demography, clinical syndromes and quality indicators for spontaneous OMI It was consistently studied in the 1st clinic of SamSMU and in the central hospitals of the city of Samarkand. As a result, this became the basis for improving the standards of pre-hospital and inpatient care to improve results. Spinal cord infarction (SMI) is one of the rare causes of acute non-traumatic myelopathies and makes it possible to explain ischemic

stroke in rare cases, which is characterized, on the one hand, by a high degree of supply of spinal cord blood vessels, and on the other hand, by a reduced sensitivity of the spinal arteries.

Nevertheless, atherosclerosis is one of the most common causes of spontaneous AMI.

1. The spectrum of conditions leading to spontaneous OMI is wide; among the frequent causes are aortic atherosclerosis, systemic hypoperfusion, cardiogenic embolism, vertebral artery dissection, and spinal pathologies.

2. It is necessary to determine spontaneous BMI. Complications of aortic surgery, spinal decompression, OMI, and epidural steroid injections.

Sudden pain in the lower back and extremities, usually localized in the affected dermatomal area. Subsequent development of neurological signs in the spinal cord is characteristic. The neurological picture of AMI depends on the degree of damage. In this case, the spinal cord and the vascular zone are involved in the manifestation of neurological symptoms, the peak of which was observed in the first 12 hours. However, the above conditions manifested in five patients within four hours.

4. Transient ischemic attack (TIA) With the rapid onset of severe myelopathic deficit, its subsequent rapid resolution occurs spontaneously. This occurs only in 3% of cases of AMI.

5. Previously, spinal artery syndrome (SAS) was the most common clinical condition, with abrupt or acute development of OMI lasting from several minutes to several hours. Disability following spinal cord stroke is common and characterised by severe and persistent disability, comprising approximately 50% of patients who need help walking.

6. Improvement of the prognosis is associated with the proposed treatment strategies. Strategies oriented towards this concept depend on the standards of reperfusion and, at the same time, the unit of treatment of stroke. Nevertheless, delayed hospital treatments and early diagnosis are hindering results in potentially treatable cases. In addition, it is difficult to quickly eliminate standardized and differential ones. Therefore, AMI is a frequently diagnosed and misdiagnosed disease. Thus, the introduction of diagnostic criteria for spontaneous AMI was proposed by Zalevsky in 2019. In addition, previous studies of OMI show that the subsequent reporting of patients with monocentric and mainly small numbers is inaccurate. Moreover, only a few major studies are aimed at classifying only spontaneous OMI and the individual etiology of the condition targeted there. This study provides a functional result on such indicators as procedures aimed at analyzing pre-hospital and inpatient patients, clinical presentation, etiology, diagnostic accuracy, and reperfusion therapy.

Materials and methods

Research design and patient selection. A retrospective study of patients admitted to the departments of neurology was conducted in the 1st clinic of SamSMU and the central hospitals of the city of Samarkand. The research period covers the years between 2000 and 2020, and the research during these years was conducted in the institutional electronic patient registration and database.

aimed at identifying cases of spontaneous OMI. We will later

We reviewed the data of all patients to verify the diagnosis. The Ethics Committee of Uzbekistan evaluated and approved the research of SamSMU (415-EP/73/750-2017). Retrospective anonymous information is not required for written consent in accordance with national regulations. For diagnostic criteria, we used spontaneous diagnostic criteria.

OMI classification proposed by Zalewski et al. These include "certain" (1, 2A, 2B, 2C, 4), "probable" (1, 2A,2B, 3, 4), and "possible" BMI (1,2,3, 4).

The criteria are:

1. Minimization of severe motor or sensory impairment within 12 hours with acute non-traumatic myelopathy;

2. MRI:

a) absence of spinal cord compression;

(b) supporting intramedullary

T2-hyperintensity spinal cord injury;

(c) Special (1): DWI/ADC limit,

Infarction of the vertebral body, arterial disorder / occlusions accompanied by stroke;

Cerebrospinal fluid (CSF): non-inflammatory (normal cell count, no boundaries within the IgG index, no oligoclonal bands);

4. Exclusion of alternative diagnoses.

Complete recovery lasting less than 24 hours in patients diagnosed with spinal TIA as acute myelopathy. Absence of movement of the lower extremities and all movements in tetraplegia when paraplegia is classified as absent.

Diagnostic work: comprehensive diagnostic work was carried out in both laboratory and CSF centers. Magnetic resonance imaging (MRI) of the brain and spinal cord was mandatory, and studies and differences to determine the cause were excluded. Common examinations include cervical CT or MRI angiography, carotid and vertebral artery sonography, thoracoabdominal CT or MRI angiography, digital subtract angiography, spinal cord and transthoracic/esophageal heart echocardiography. Metabolic, infectious, and autoimmune conditions were assessed. Investigations included vitamin B12, copper,

zinc, serological serum levels of syphilis, Borrelia, varicella-zoster virus, human immunodeficiency virus, human T-lymphotrop virus 1, antinuclear antibodies, antibodies for the isolation of capable nuclear antigens, anticyclic citrullinated peptic flow and antineutrophilic and cytoplasmic antibodies.

By studying the vascular profile, coagulation parameters and antiphospholipid antibodies were assessed. Further serological studies include aquaporin-4/IgG and paraneoplastic antibodies. Electromyography/neural conductivity studies were performed in some patients. CSF estimates include white blood cell count, red blood cell count, protein, glucose, and cytology. Subsequent studies deemed appropriate included the IgG index, oligoclonal bands, Gram staining and bacterial culture, as well as appropriate examination to rule out neurological manifestations of syphilis and borreliosis; streptococcal antigen and angiotensin-converting enzymes. Further voluntary studies were conducted on PCR for the Varicella-zoster virus, Epstein-Barr cytomegalovirus, enterovirus, and mycobacterial tuberculosis. Clinical assessment of age, sex, and medical records from the moment of hospitalization were recorded. Additional parameters include the following clinical manifestations: deficiencies, presence of acute pain in the neck, shoulders, scapula, chest, abdomen, and back; (normal bilateral functions with the most caudal spinal cord segment); joint position sensation and vibration tests; urinary or stool retention; and mechanical required acute respiratory failure ventilator support. Vascular risk factors Vascular risk factors include identified hypertension: systolic blood pressure > 140 mmHg, diastolic blood pressure > 90 mmHg, or current use of hypertensive drugs; diabetes mellitus: symptoms of diabetes and fasting
glucose > 126 mg/dL and blood glucose after eating >200mg/dL or
current use of antidiabetic agents; hyperlipidemia:
use of cholesterol > 200 mg/dl, triglyceride > 150 mg/dl, or lipid-reducing drugs; atrial fibrillation. Previous stroke or TIA (clinical history and chart recordings); myocardial infarction (clinical history, chart recordings and ECG); heart disease (constrictive heart failure, arrhythmia and heart valve disease); and smoking.

Etiology assessment

Adapted etiology from classification
Nedeltchev et al. 12

1. High risk of atherosclerosis: history or prior history
vascular or TIA, myocardial infarction or multiple vascular risk factors;
2. Aortic disease: aortic aneurysm, fission, or atheroma with or without surgery;
3. Cardiac embolism;

4. Neighboring spinal disease/degenerative disease: concurrent with spinal cord ischemia, compromised vascular risk factors in no more than one patient, which may be caused by the spinal artery;
5. Systemic hypotension;
6. Iatrogenic;
7. Unknown cause.

If the cause of the disease is not found, the category "unspecified" is used, 1-7 points are assigned for classification. MRI of the spinal cord The minimum requirements for MRI are sagittal T1 weight fast spin-echo sequences, sagittal T2 weight images, and T2 weight images at the level of axial stroke. All images have been rechecked. The columns of the spinal cord were assessed for corpus vertebrae infarction. Diagnosis requires extensive longitudinal injuries with the presence of T2-hyperintensive expansions of three or more vertebral segments. By definition, clinical syndromes are divided into anterior spinal artery (ASA), posterior spinal artery (PSA), and transverse OMI. Additional variants for ASA infarctions include the involvement of the anterior unilateral, anterior bilateral, and central vessels.

Result

The result is divided into two based on a discharged ambiance: good (whether walking is possible independently or with the help of one person) and bad (death, cannot walk, or can walk with two helpers).

Statistical analysis

We used the Yate correction test ch2 or Fisher's exact test and nonparametric Kruskal-Wallis test to compare qualitative changes, comparing quantitative variables. p values are considered statistically significant if they are less than 0.05. The analysis was performed using Windows STATA SE 13.0 (StataCorp LP, TX, USA).

Results

A total of 96 patients were identified during patient demography and hospitalization. In four patients with TIA of the spine and in four more patients, the period from the appearance of symptoms to the onset of the disease lasted more than 10 days (4.2%). In the study group of 88 patients, 48 (54%) patients were selected from the 1st clinic of SamSMU. In the Samarkand City Central Hospital there were forty patients, as reported in the previous study. In addition, the subset summarizes the number of patients with PSA infarction in Samarkand city hospitals in a short dialogue.

The median age was 65.5 years [interquartile range (IQR) = 56-74] and 45 (51%) were females. There were no demographic differences (age, gender) between the 1st clinic of SamSMU and the central hospitals of the city of Samarkand. Time showed that the tendency to identify cases was 39% in the first half and 61% in the second half of the study period (Fig. 1). The annual number of patients peaked in 2011 (n=8) at the I Clinic of SamSMU and in 2014 (n=6) at the Samarkand City Hospital. The exact time from the onset of symptoms to hospitalization is present in 36 (40%) patients. The mean time (IQR) was 258 min (110-528) and did not differ between centers. Vascular risk factors There were one or more vascular risk factors in 79 patients (82%). Most often, hypertension (69%), hyperlipidemia (33%), and diabetes mellitus (25%). There were no differences in the frequency of these concomitant diseases between the two centers. However, a higher level of anterior vascular and TIA was noted in Samarkand (19%) compared to 2%. Additional comparative details are provided.

Etiology of spinal cord stroke

There are eight different etiologies. In patients admitted to the Samarkand City Hospital, where there are only four cases in Samarkand, there are pathologies of the aorta, degenerative diseases of the spine, hypotension, and iatrogenic diseases. In the aorta in Samarkand (29%), this is either rare (total 2% for aortic pathology) or absent (degenerative, cardiac, iatrogenic) in Samarkand city hospitals. The etiology of atherosclerosis is most widespread in Samarkand (50%), most often the cause remains unknown in Samarkand city hospitals (52.5%). The group of patients with unknown etiology was on average 8 years younger (on average = 57 years, IQR = 45-69, p = 0.003) compared to the group with atherosclerosis (on average = 69 years, IQR = 61-76) and other etiologies (on average = 64 years, IQR = 53-75). In addition, in the group with an unknown etiology, where the proportion of women was high (67%), compared to 51% in the entire cohort, p = 0.115. Accuracy according to diagnostic criteria: the use of Zalewski et al.7 criteria, 32 (36%) were classified as accurate, 35 (40%) as probable, and 21 (24%) as possible OMI. Accurate diagnosis of AMI is less common than in Samarkand city hospitals [20 (42%) 12 (30%)]. However, cases classified as possible AMI are lower than in Samarkand city hospitals [11 (23%)

24 (60%), p<0.001). Clinical manifestations and syndromes Motor dysfunction was the most persistent. Neurological disorders were identified and present in 76 (86%). Pain was reported in 65% and localized to the level of the spinal cord in 54 (61%) strokes. CNS disorders (paresthesia or dysesthesia) were noted in 60% of cases. Differentiation of clinical symptoms

Presentation and etiology are given in Table 2.

The main syndrome was a bilateral ASA infarction (73%). Less common manifestations are shown in Table 3. CSF and excited potentials

A total of 64 patients (72%) underwent CSF examination. Pleocytosis was detected in 4 patients.

(4%) and increased CSF protein in 39/47 (83%). There is no case with the presence of CSF-specific oligoclonal bands. Excited potentials were performed in 31 (36%) patients; the rates did not differ between the centers (p=0.07).

Neuroimaging In 56 patients, the details of triage in the hospital were restored. The time from the average time of receiving MRI of the spinal cord from 148 min (IQR = 90-312) to the first MRI in the period from 2016-2020 (median = 127 minutes, IQR = 60-234) decreased by almost half an hour compared to the first 15 years of study (average = 155 min, IQR = 104-350). Regardless of the positivity of the T2 or DVI sequence (12% of patients did not have radiological reports), the first MRI was a diagnosis of OMI in 40 years (45%). An excellent neuromagnetic result was recorded in 29 (33%), while the remaining cases were assessed as uncertain. One second MRI was performed in 70 patients (80%). This study was characterized by stroke (T2 or DVI) in 42 (60%) patients. Initially normal or indeterminate MRI, characteristic of BMI, was performed in 19 (70%) patients with the second MRI. Nine patients (13%), the second MRI did not show spinal cord injury. The average time from admission to the second MRI is 3 days (IQR = 2-5), N =41/88 (46%). DVI was part of the first MRI of the spinal cord in 43 cases (49%). DVI was positive in 13 (30%). In the second MRI examination, a normal examination used in 19 patients with a previous DVI. In this group, 15/19 patients (78%) had newly developed DVI lesions (i.e., DVI conversion). DVI positivity (first and second MRI combined) was more common in young patients (p=0.033). The average age of DVI-positive patients was 61 (IQR = 52-69) and 68 (59-75) without changes. In addition, the possibility of detecting DVI was higher in the cervical spine with isolated lesions (9/27, 33%) and the presence of estrodiol thoracolombus (8/27, 30%), compared to other localizations. There was a high probability trend. DWI positivity in the later period, i.e., after 2015; however, this observation was statistically insignificant (p=0.089). Spinal angiography was performed in 17 (19%) patients. There was a slight difference between the centers for this exam (27% in SamDTU Clinic I and Samarkand City Hospital 10%, p = 0.058). Single patient with vertebral corpuscular infarction

of the sixth thoracic vertebra, which correction. First MRI: combined analysis of T2 and DWI The presence of findings characteristic of OMI in the first MRI (including those with

positive DWI). The most common spinal MRI localization was found on the first MRI, characteristic of BMI, in the thoracolumbar region with estradiol (40%). In addition, the most common presentation of the motor was monoparesis (42%) in patients with MRI findings characteristic of OMI, and the least frequent was paraparesis (5%). Time of hospitalization and placement Spinal cord injury Analysis of the pre-hospitalization time revealed that 17/36 (47.2%) patients sought an ER during a potential time interval (IV) for thrombolysis (<4.5 hours) for intravenous administration. The average times were the same between the centers (Clinic I of SamSMU 47%) and the Samarkand City Hospital 58%, p=0.73). DWI was positive in three patients (19%) who arrived within 4.5 hours, and findings characteristic of OMI, supporting positivity in DWI or T2, were present in 6/17. (37%) patients. IV thrombolysis Two patients (2.2% and 6% of the entire cohort) received systemic IV thrombolysis. The works were received within 4.5 hours, one at the Samarkand City Hospital (initially presumed as stroke syndrome of the middle cerebral artery) and (Clinic I of SamSMU (initially revised as OMI). Patient No. 1 was a 57-year-old woman who presented ASA syndrome and had a corresponding MRI with a cervical level lesion. The etiology was classified as unknown, and its outcome was poor (mRS = 5). Patient No. 2 was a 57-year-old male with a clinical syndrome involving the anterior and posterior segments of the spinal cord and did not show a recurrent MRI lesion. The etiology was classified as atherosclerosis, and the result was good (mRS = 3).

Result

The result was studied upon discharge from the hospital, and a clear clinical picture was observed in 77 (88%) patients. 40 cases (46%) with good results and no differences between the two centers. The level of patients was ten times higher than the unknown result (Clinic I of SamSMU (21% versus 2%, p=0.013). Four patients died in the hospital of the I clinical cohort of SamSMU, almost half of them died in the Samarkand City Hospital. At the time of discharge, patients had autonomic disorders 39 (48%), most often overlapping localization 19 (39%) and anterior artery syndrome 38 (78%). When discharged, eighteen patients (20%) could walk home, 14 (16%) needed walking assistance, 32 (36%) had a mobile wheelchair, 11 (13%) were bedridden. The examined patients were significantly younger than other functional results (57 years IQR = 63, 55-73 versus 53-61 years; p=0.037). Good result in patients with cervical localization of OMI, seven patients (39%) on an outpatient basis at the time of complete discharge. Additional details of the results associated with various etiologies are presented in Table 2. At the Samarkand City Hospital, one patient had a relapse of AMI in the aorta. He initially addressed with paraparesis; DWI positivity was located in the ASA region and ranged

from Th10 to L1 levels. Etiology classified as unknown, possibly coagulopathy. At the end of the first hospitalization, he can walk with assistance and is discharged with anticoagulation therapy. The second incident occurred five months later and the same related spinal cord region. Clinical outcome during release in interaction.

General analysis of MRI localization with localization and OMI syndrome (eight categories) and OMI syndrome (seven categories) gave 56 objects distributed according to three results categories. Patients with cervical spinal cord localization and anterior spinal cord syndrome (n=12, 14%) had the best prognosis, 8/40 (20%) fall into the category of good results. Worst of all, the sympathetically repeating spinal cord (i.e., MRI of two or more segments) and ASA syndrome were observed. In this subgroup, 15/37 (41%) achieved a poor result. Most of our patients received antiplatelet therapy, as shown in Table 2.

This retrospective study of 88 patients with spontaneous OMI was conducted in two third-degree medical care centers. Research conducted in Samarkand for more than 20 years confirms that 32 cases are confirmed (36%), 35 cases are probable (40%), and 21 cases are possible spontaneous OMI (24%). The clinical picture is diverse, and in a subgroup of patients, apoplectic onset of OMI, the presence of pain, and movement disorders may be present. Although OMI is constructed as an exceptional diagnosis, it is an acute condition that should be considered after eliminating alternative etiologies such as spinal cord compression. Moreover, almost half of the patients achieved poor results. In addition, we identified four cases of spinal TIA (4.2% in the entire clinic), which corresponds to 3%. In the only comprehensive study on this topic, there were no age and gender-related differences in the message so far. Our research confirms that spontaneously occurring AMI is a common disease, despite the significant heterogeneity of the etiology. The average age of transition from the middle end to the upper level was 65.5 years, 51.5% of patients were women. Our research can be mainly compared with the research of multidisciplinary medical centers. In this case, in Tashkent there were 28 patients with a study age of 62 years (29% of women) and in Samarkand - 102 patients with a Samarkand retrospective study with an average age of 60 years (53% of women). The study period for learning Russian was from January 2001 to January 2004 and from 1997 to 2017 for the series "Uzbekistan" with a monocentre. The subjects of the study reported that the cause of OMI was younger than patients with dissection of other etiologies (59.8 years versus 39.8 years). Our study concluded that among patients diagnosed with spontaneous AMI, there was an increasing number of job identifications after 2000 and 2020 and 2015. The reason is that this observation remains speculative, but increasing awareness may be associated

with a combination of taking into account BMI in elderly patients and increasing the availability of MRI. Transverse myelitis was a significant difference from OMI, and the misdiagnosis may have occurred less frequently. We must acknowledge the changes. From 1.5 to 3 Tesla scanners across the study. Differences in field sensitivity The strength for detecting stroke associated with OMI has not yet been studied, however, the analysis of lesions revealed discrepancies not associated with multiple sclerosis in 1.5 and 3 T. We found an equal distribution by gender, several final rows Also confirmed the predominance of men for spontaneously occurring BMI. These studies can serve as a model; the female level in Russian was 41 patients, the Indian series - 17 patients, and the English series - 14 patients - 41.5%, 35.3%, and 42.9%. In our series, patients without vascular comor were a minority (18%). Among the anterior vascular risk factors, runners had hypertension and hyperlipidemia. In Uzbekistan, the frequency factors for consecutive, non-vascular risk patients were even higher (24%).7 There were no differences between sites for vascular comorbidities, but a higher frequency of previous stroke and Samarkand vascular neoplasia. It is interesting to find a clear distribution of suspicious etiologies in two places. This may be a causal situation related to differences in the classification, since the city of Samarkand had an advantage - patients with OMI of unknown etiology and a possible rate were higher. The findings in the city of Samarkand correspond to a recent study of 41 cases of spontaneous AMI, the etiology of which is not established (29%), despite the presence of vascular comorbidities in 9/12 of patients (75%). This necessitates determining the etiological classification and subsequent preliminary studies. We also proved the etiological classification of changes over time in the scientific literature. In the Tashkent study, 27 patients (during the study period from 1990 to 2003) and in the Bukhara study (1993-2007) of 22 patients, the causative factor was not identified in 74% and 60%, respectively. Compare our study, where these observations determined the cause - two-thirds of cases. Fibrocartilaginous embolism (FCE) was the recommended etiology in a small group of patients in the United States. Regions (5.5% and 14% respectively). In our studies, FCE was not classified as a cause of OMI, mainly due to a high level of vascular comorbidities and previous cerebrovascular events. For this purpose, FCE and preliminary studies are conducted, recognizing them as diagnostic criteria. The level of unknown etiologies is also unlikely, and over time their consideration decreases even more, since fewer and fewer reasons are considered in clinical practice. For example, among the emerging evidence, there are spontaneously occurring types of infarction.

Conclusion:Assessing the presence of risk factors in patients with spinal cord stroke, studying the influence of these factors on the cause and course of the disease, and collecting data for their assessment. Improvement of the system of measures for modern treatment and rehabilitation is the restoration or compensation of impaired functions, correction of associated deformities, solving the problems of maximum adaptation (social, professional) of these patients to society, achieving the maximum level.

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