

CHARACTERISTICS OF CLINICAL AND MEDICO-LEGAL DIAGNOSIS IN CASES OF DISCREPANCY

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Abstract: Although technical possibilities of diagnosis in modern medicine are incomparably greater, even nowadays, diagnostic mistakes are identified during autopsy in a considerable number of cases. Moreover, in the last decades, the frequency of discrepancies not only stayed at the same level but also increased. The present research is a selective retrospective analytical study based on 152 medico-legal reports regarding the corpses of patients who died in hospitals, as well as their medical records for a period of 5 years (2009–2013). All the dead bodies were examined in the territorial departments of the Center of Forensic Medicine of Republic of Moldova. The study aimed to analyze and classify discrepancies between clinical and medico-legal diagnoses in mechanical traumas. Brain injuries were most frequently diagnosed (clinical and morphological) in the researched sample, this kind of trauma was also most frequently under- and overdiagnosed. All the nosological units in the study were more frequently underdiagnosed than overdiagnosed. Most of the discrepancies were found in the main diagnosis, manifested by underdiagnosis and attributed to the 2nd category.

Keywords: discrepancy, clinical diagnosis, medico-legal diagnosis, medical care quality, underdiagnosis, overdiagnosis, misdiagnosis.

INTRODUCTION

Legal medicine service activities are varied and one of the important ones is to improve the medical care quality, which is achieved by detecting deficiencies during diagnosing and treatment, analyzing cases of discrepancies between clinical and medico-legal diagnoses, and discussing autopsies results with physicians. In this way, scientific control of diagnosing and treatment is ensured and admitted deficiencies are corrected, actions which improve the physician's theoretical knowledge and practical skills.

Although technical possibilities of diagnosing in modern medicine are incomparably greater, scientific researches demonstrate that, even nowadays, diagnostic mistakes are identified during autopsy in a considerable number of cases [1]. Thus, according to various sources, the frequency of discrepancies between clinical and medico-legal diagnoses oscillates between 3.5 to over 50% depending on the period and place of the study, its methodology, classification of discrepancies, causes of death and other factors. Moreover, different authors noticed that, in the last decades, the frequency

of discrepancies not only remained at the same level but also increased [2–5]! If in the '90s researchers recorded a discrepancy rate of approx. 10% [6], then in 2000-2005 this indicator almost doubled up to 19.85% [7].

OBJECTIVE

The study aimed to analyze and classify discrepancies between clinical and medico-legal diagnoses in mechanical traumas.

MATERIALS AND METHOD

The present research is a selective retrospective analytical study. 152 medico-legal reports regarding corpses of patients who died in hospitals, as well as their medical records for a period of 5 years (2009–2013), were analyzed. Only cases with discrepancies between clinical and medico-legal diagnoses were included in the sample. The presence of mechanical trauma in the medico-legal diagnosis was also one of the inclusion criteria. All the dead bodies were examined in the territorial departments of the Center

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of Forensic Medicine of Republic of Moldova. In order to ensure the representativeness of the sample, we selected cases of inpatient deaths at all levels of hospitals.

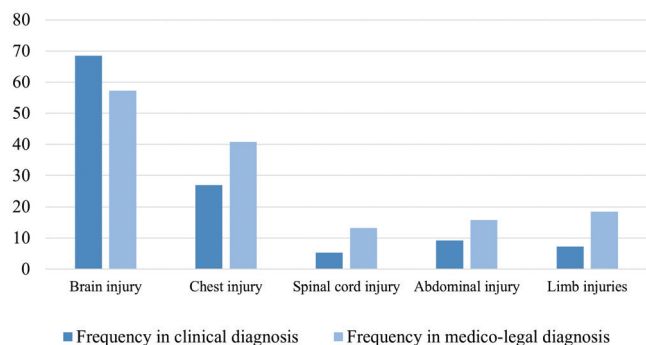


Figure 1. Comparative frequency of different types of injuries in clinical and medico-legal diagnoses.

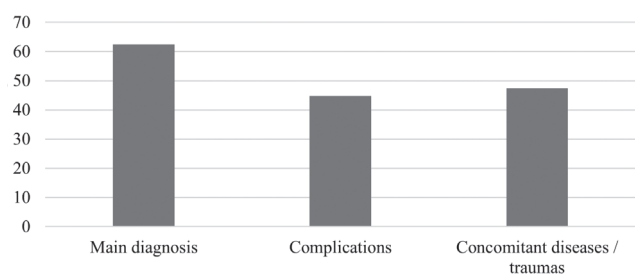


Figure 2. Discrepancies' frequency according to diagnosis compartments.

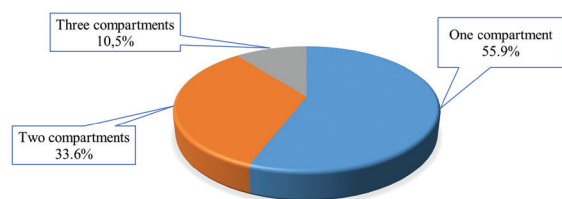


Figure 3. Proportion of discrepancies depending on the number of involved diagnosis compartments.

Table 1. Frequency of clinically under- and overdiagnosed nosologies

No.	Type of trauma/pathology	abs	P±ES%	t	p
Underdiagnosed					
	Brain injury and/or its complications	42	27.63±6.90	4.0	p<0.001
	Chest injuries and/or their complications	37	24.34±7.06	3.5	p<0.001
	Spinal cord, abdominal, and limb injuries and/or their complications	36	23.68±7.09	3.3	p<0.001
	Diseases (cardio-vascular, gastro-intestinal, respiratory)	37	24.34±7.06	3.5	p<0.001
	Infectious complications of injuries (meningitis, pneumonias, peritonitis etc.)	16	10.53±7.67	1.4	p>0.001
	Iatrogeny	2	1.32±8.06	0.2	p>0.001
Overdiagnosed					
	Brain injuries and/or their complications	44	28.95±6.84	4.2	p<0.001
	Spinal cord, chest, abdominal injuries and/or their complications	17	11.18±7.64	1.5	p>0.001
	Diseases (cardio-vascular, gastro-intestinal, respiratory), infectious complications of injuries (meningitis, pneumonia, peritonitis etc.), hypothermia and alcohol intoxications	23	15.13±7.47	2.0	p<0.001

RESULTS AND DISCUSSION

In the present study, all injuries, including those from combined diagnoses, were grouped according to the topographical principle. Figure 1 shows that brain injuries were most frequently diagnosed in the sample, both clinically and morphologically. The frequency of this diagnosis at the clinical stage is higher compared to the morphological one, which indicates the trend of brain injury overdiagnosis. We consider that this situation is explainable: according to different sources of data [4, 8, 9], brain injury is one of the dominant causes of mortality, which constitutes 40% of all traumas, ranking third after cardiovascular and oncological causes. In the USA, brain injury is the most important cause of death, representing approx. 30% of all lethal injuries [4].

Brain injuries are followed by chest injuries. They were diagnosed clinically almost 2 times less often than morphologically, which indicates an underdiagnosis of this type of trauma. One of the noticed reasons is the frequent underdiagnosis of rib fractures. A similar situation was reported by S.H. Cho *et al.* [10].

Other types of traumas (spinal cord injury, abdominal and limb injuries) had an almost similar frequency, but they were clinically underdiagnosed in all cases.

Table 1 data shows that both trauma and its complications, as well as pathological processes, were more frequently underdiagnosed than overdiagnosed, which can present certain risks for the patient because underdiagnosis can have worse consequences for the patient. Thus, any missed and untreated trauma or its complication decreases the patient's chances of full recovery and, at least, their survival.

On the contrary, overdiagnosis represents,

according to J. Brodersen *et al.* (2018), an actual problem of the contemporary health system, including because of financial issues, which generates additional expenses related to unnecessary prescriptions. At the same time, the authors believe that medical tactics in this case rarely cause patient's death [3]. We agree with this opinion: in the circumstances of a trauma that requires emergency medical care, especially in cases of associated traumas, overdiagnosis is explicable and even reasonable.

It is to mention that brain injuries and their complications were under- and overdiagnosed almost equally. Traumas located in other anatomical regions of the body, especially those of the chest, spinal cord, abdomen and limbs, as well as pathological processes, were underdiagnosed with almost the same frequency which varies between 23 and 24%. At the same time, both infectious complications and lethal iatrogenies

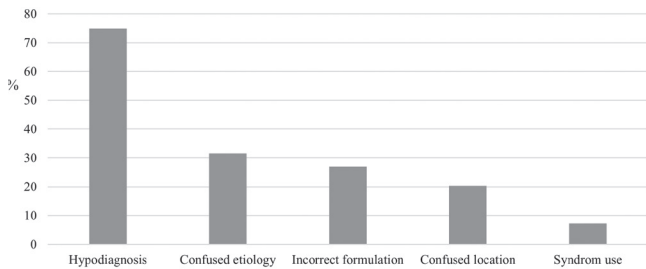


Figure 4. Frequency of different discrepancy types in main diagnosis.

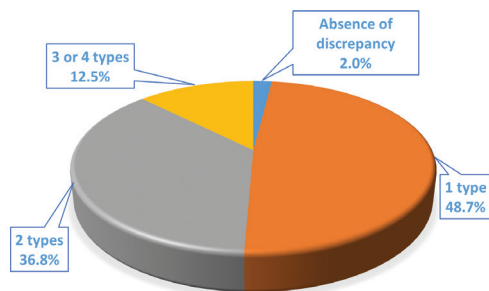


Figure 5. Proportion of different types association in discrepancies related to the main trauma.

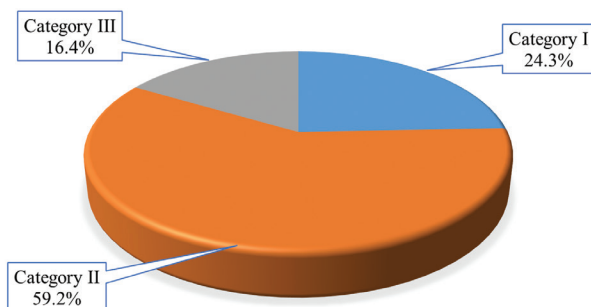


Figure 6. Proportion of discrepancy categories.

had a low frequency, being statistically insignificant.

In the section of overdiagnosed traumas, brain injuries are followed by various pathological processes, infectious complications, hypothermia and alcohol intoxication, which have statistically significant frequency ($15.13 \pm 7.47\%$). One of the possible explanations of this observation is the supposed use of nosological units in the final diagnosis which was not established certainly. For example, frequently physicians include pulmonary thromboembolism in the final diagnosis in cases of fast sudden death.

The highest frequency of discrepancies (Fig. 2) was established in the main diagnosis ($62.50 \pm 4.97\%$), which is one of the key quality indicators of the diagnostic process and one of the important objectives of clinico-anatomical conferences [11]. The frequency of discrepancies in complications and concomitant pathologies/traumas is almost equal, with an insignificant difference of about 3%.

Single discrepancies in only one diagnosis compartment and combined ones (i.e., those found in two or three parts of the diagnosis) were subjected to analysis too.

The charter from Figure 3 shows that the discrepancies were found in only one diagnosis compartment: main disease/trauma, its complications, or the concomitant disease/trauma in almost half (55.9%) of the analyzed cases. At the same time, discrepancies which involved two parts of the diagnosis were noticed in a third part (33.6%) of the sample. The most severe discrepancies, related to all three diagnosis compartments, were found less frequently (10.5%), however, these cases are a complete misdiagnosis with all its unfavorable consequences.

The analysis of discrepancies in the main diagnosis compartment (Fig. 4) revealed its several types: underdiagnosis (hypodiagnosis) of the traumatic process ($75.00 \pm 4.06\%$); incorrect formulation of the diagnosis ($26.97 \pm 6.93\%$); confused etiology ($31.58 \pm 6.71\%$) and/or anatomical location ($20.39 \pm 7.24\%$); syndrome use instead of nosological diagnosis ($7.24 \pm 7.81\%$). Incorrect formulation included the following cases: confused etiopathogenesis of the traumatic process, replacement of the main nosology with its complications and lack of diagnosis partition. The highest frequency had undiagnosed or incompletely diagnosed main traumas, which represent a major risk for the patient. Wrong etiology or location assessment of the trauma can also affect the quality of medical care, but with less severe consequences. Incorrect formulation of the diagnosis is a kind of “technical” discrepancy, which does not

affect the patient's condition but is attributed to the 2nd category [11]. Such diagnoses cannot be codified, statistically analyzed and subjected to confrontation.

The further analysis of different types of discrepancies in the main trauma (Fig. 5) showed that those of a single type (48.7%) and combination of two or more types (49.3%) had approximately the same proportion. We have to mention that the existence of just one type of discrepancy is enough to assess a mistake in the main trauma diagnosis.

An indicator of diagnostic process quality and its correlation with the patient's prognosis is the discrepancy category.

Figure 6 reflects the proportion of discrepancy categories. The "lightest" discrepancies – category I, which are generated by only objective causes and do not influence the treatment outcome, were recorded in 24.3% of cases. Most of the discrepancies – almost two thirds (59.2%) – were from the 2nd category. This group includes cases when the hospital possibilities allow a correct diagnosis, but the mistake does not significantly influence the patient's prognosis. Discrepancies due to the wrong formulation of the final diagnosis are also attributed to this category. The 3rd and the most "serious" category of discrepancies due to subjective causes only had the lowest proportion in the studied sample – 16.4%. The presented data correlates with that obtained by A.V. Maksimov: during the 5-year period (2014-2018), the proportion of the 1st category divergences in the Moscow Region was 32.7%, 2nd category – 52% and 3rd category – 15.3% [12].

In conclusion, brain injuries were most frequently diagnosed (clinical and morphological) in the researched sample, this kind of trauma was also most often under- and over-diagnosed. All the nosological units in the study were more frequently underdiagnosed than over-diagnosed. Most of the discrepancies were found in the main diagnosis as they were represented by underdiagnosis and attributed to the 2nd category.

Conflict of interest

The authors declare that they have no conflict of interest.

Ethical statement

The design of the present study was discussed and approved by the Ethical Committee of Nicolae Testemitsanu State University of Medicine and Pharmacy.

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