FORENSIC MEDICAL ASSESSMENT OF POST-TRAUMATIC SENSONNEURAL HEARING LOSS, CONSIDERING LESIONS OF THE VESTIBULAR ANALYZER

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Abstract: The features of the clinical course and outcomes of post-traumatic sensorineural hearing loss were analyzed in accordance with the criteria for determining the severity of bodily injuries. The etiopathogenetic variant and mechanism of occurrence of post-traumatic sensorineural hearing loss have been established, taking into account the localization of damage to the soft tissues of the head and middle ear.
Keywords: Ear, method, analysis, technology of treatment.

INTRODUCTION

In the structure of ear injuries, local mechanical damage to the hearing organ, leading to the development of post-traumatic sensorineural hearing loss (SHL), accounts for up to 10.4% of cases. The share of forensic medical examinations (FME) for traumatic brain injury (TBI), which in 70–75% of cases can be complicated by the development of PST, is 12.7% of their total number.

MATERIALS AND METHODS

Objectives of the study: 1) analyze the features of the clinical course and outcomes of SHL in accordance with the criteria for determining the severity of bodily injuries; 2) during FME, conduct a comprehensive vestibulometric study of victims with SHL; 3) during SM diagnostics, to identify the nature of vestibular disorders in victims with SHL;
4) to draw forensic parallels between auditory and vestibular disorders in persons with SHL; 5) establish the features of the forensic medical assessment of SHL depending on the nature of vestibular disorders.
Between 2017 and 2023. We have conducted 79 FMEs (examinations) for SHL. For some victims with SHL, several examinations were carried out: primary, additional, and repeated. During the examination, the 31st victim at the Fergana City Clinical Hospital, along with tone threshold and suprathreshold audiometry, underwent a comprehensive otoneurological study. In 20 victims with SHL, there was an indirect mechanical injury to the auditory analyzer, and in 11 victims there was a combined injury (baro-mechanical). Traumatic brain injury in the form of a concussion occurred in 24 victims, and in the form of mild to moderate brain contusion – in three victims. The predominant number of observations were males (58.1% of observations). More than half of the injuries (64.6% of observations) occurred between the ages of 21 and 50 years.

RESULTS AND DISCUSSION

Depending on the dynamics of changes in auditory function and SHL outcomes, as well as in accordance with the criteria for determining the severity of bodily injuries, all observations were divided into four groups [2]:
1) complete restoration of hearing function – six victims;
2) positive dynamics of changes in auditory function without its complete restoration – 12 observations;
3) persistent decrease in auditory function without dynamics – 10 cases;
4) negative dynamics of changes in auditory function - three victims.

An otoneurological study of two victims from group I was carried out within 21 days from the moment of injury, in parallel with the first study of pure tone threshold audiometry; in the remaining victims - in parallel with the second study of pure tone threshold audiometry.
A comprehensive audiological and otoneurological study made it possible to determine the etiopathogenetic variant and mechanism of occurrence of SHL (from local exposure to traumatic factors in the temporal region or as a consequence of TBI). In addition, the location of injuries to the soft tissues of the head and the presence of injuries to the middle ear were taken into account. It was believed that SHL is a consequence of local mediated mechanical injury to the peripheral part of the auditory analyzer, which is combined with TBI in the form of a concussion: in two victims with signs of damage only to the peripheral part of the auditory and vestibular analyzer; in one - only with the presence of signs of damage to the peripheral part of the vestibular analyzer; one – with mixed lesions of the vestibular analyzer, but predominantly in the peripheral part; in two – with damage to the peripheral part of the auditory analyzer and the central part of the vestibular analyzer; one had signs of mixed damage to the vestibular analyzer and the peripheral part of the auditory analyzer.
In these observations, SHL as a consequence of trauma to the auditory analyzer and TBI in the form of a concussion, in our opinion, can be divided according to the severity of bodily injuries and assessed separately. It was believed that SHL arose from a local mediated mechanical injury to the auditory analyzer in observations in which there were no corresponding symptoms of a concussion, but in the presence of signs of damage to the peripheral parts of the auditory and vestibular analyzer in two cases and in one case - in the presence signs of damage to only the peripheral part of the vestibular analyzer. It was believed that unilateral SHL arose as a result of TBI in the form of a concussion in three patients with cerebral-pontine angle syndrome, and in one of them with mixed damage to both the auditory and vestibular analyzers, in 1 - with mixed damage to the vestibular analyzer, one with mixed damage to the vestibular analyzer and damage to the peripheral part of the auditory analyzer; one had mixed damage to the auditory analyzer. It was believed that unilateral SHL arose as a result of TBI in the form of a moderate brain contusion in one victim with mixed lesions of the vestibular analyzer; one had a lesion of the central part of the auditory analyzer and a mixed lesion of the vestibular analyzer.

CONCLUSION

The studies carried out allowed us to draw certain conclusions.
1. In all victims with SHL who underwent FME, damage to the vestibular analyzer is detected to one degree or another.
2. When performing FME for SHL in a specialized otolaryngology hospital, an otoneurological examination should always be performed.
3. When assessing SHL, it is advisable to determine the level of damage to the vestibular analyzer along with the auditory one. This will make it possible to objectively determine the nature of SHL, the mechanism of its formation and correctly assess the severity of bodily injuries.
4. During FME of individuals with SHL, an otoneurological examination in conjunction with a comprehensive audiological examination will allow an objective assessment of mild forms of TBI by the SM.

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