EAR BLAST INJURY IN MILITARY POPULATION: A 12 MONTHS FOLLOW-UP

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Introduction

- Otological accidents resulting from mine explosions are polymorphous, mainly affecting deployed military personnel.
- A delayed treatment, usually by lack of knowledge and / or association of injuries considered to be more serious, can worsen the auditory prognosis.

Material and Methods

- We have included patients treated for ear blast injury secondary to terrorist attacks at the ENT department of the Military Hospital of Tunis between 2011 and 2017.
- All patients underwent a clinical evaluation and an audiometric exploration before and after 12 months of the accident.
- Severity of hearing loss was categorized using the American Speech Language-Hearing Association (ASHA) threshold-based classification system.

Results

- 90 patients, ♂ : 100%
- Average age = 25 years [20 to 42 years old]
- Circumstances of the accident:
 - Terrorist act (100%)
 - Open space 75 cases (83%) / Closed space 15 cases (17%)
 - 64% were less than 10 meters from the center of the explosion and 30% were within 5 meters.
- Delay to ENT specialized exams : 12 hours to 3 months
- Initial otoscopic exam: Tympanic perforation (in15 patients with 8 bilateral perforation)
- Audiometric exam: 65% of patient have perceptual hearing loss (Table 1) and more than 70% of patients have mild or moderately severe hearing loss (Table 2)
- Therapeutic protocol:
 - IV high-dose of corticosteroid (300 milligrams per day of (HSHC) → All patients
 - Vasodilators (for patients with tinnitus)
 - Preventive antibiotic (amoxicillin-clavulanic acid) : in the presence of hematoma or tympanic perforation.
 - Hyperbaric oxygen therapy (HBOT) : patients with perceptual hearing loss or non-tolerated tinnitus: proposed for 53 cases → achieved by 33 patients (63%).
- center (<10 meters)

OUTCOME

- At 12 months of the accident :
 - 20% (n=18) still have painful hyperacusis.
 - Tonal audimetry and the study of the PEA objectified an improvement of hearing in 26.6% of cases (average hearing gain of 20 dB)
 - Worsening in 13% of cases by 15 to 20 dB. (Table 2)
 - 37.5% of patients: disappearance or a significant decrease of tinnitus

Twelve patients were referred for psychiatric management for tinnitus-related sleep disorders and a professional reclassification was recommended for patients with severe or profound deafness

Table 1: Type of hearing loss

Type of hearingloss	perceptual hearing loss	pure transmission deafness	mixed hearing loss	Normal
Number of cases (%)	59(65)	7(8)	18(20)	6(7)

Table 2: Initial and final hearing loss degrees*

hearing loss degrees* (dB)	Normal or slight hearing loss [0-24]	Mild [25-40]	Moderate or Moderately severe [41-70]	Severe [71-90]	Profound >91
Initial hearing loss n(%)	10(11)	29(32)	36(40)	15(17)	0
Hearing status at 12 months of accident n(%)	13(15)	36(40)	27(30)	12(13)	2(2)

*Categorization according to thresholds defined by the ASHA ; n: Number of cases

TAKE HOME MESSAGES

- Outcome was better : Early treatment (< 48 hours)
 - Medium initial deafness
 - HBOT was combined to steroid therapy.
 - Individual protection (helmet,...),
- Outcome was poor : Severe and / or bilateral pure sensorineural deafness
 - Association with tinnitus
 - Late management
 - Proximity to the explosion

Conclusion

Ear blast injuries are polymorphic, affecting several components of the acoustic-vestibular system. However, the lack of parallelism between important functional complaints and poor clinical examination often leads to an under estimation of the diagnosis. In any case, given the risk of secondary aggravation, regular monitoring and extended psychological support in these patients is largely justified.

References

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