

ANALYSIS OF ACCIDENTS AND SICKNESS OF DIVERS AND SCUBA DIVERS AT THE TRAINING CENTRE FOR DIVERS AND SCUBA DIVERS OF THE POLISH ARMY

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INTRODUCTION

The prerequisite for the prevention of diving-related sicknesses and accidents is strict compliance with both technical and medical regulations during diving training and work [3,4].

A very important issue is good knowledge of the work of a diver and the anticipation of possible dangers by the personnel participating in the dive [1]. The Military Maritime Medical Committee (WKML) determines whether or not an individual is healthy enough to dive, granting those who meet the required standards a medical certificate that is valid for one year [1,2].

There are many causes of diving-related disorders and sicknesses, hence the many different divisions and classifications in the literature. Ulewicz and Dolatkowski, amongst others, divide diving conditions into two groups [1].

I – Sicknesses and accidents caused by physical factors.

II – Diving sicknesses and accidents caused by physiopathological disorders.

The first group of diseases occurs as a result of mechanical action directly on the body of the diver. Among them are: ear and paranasal sinus barotrauma, pulmonary barotrauma, crushing.

In the second group we most often encounter the consequences of the toxic effects of gaseous components of air on the human body. This group includes decompression sickness, oxygen poisoning, nitrogen poisoning, CO₂ poisoning, carbon monoxide (CO) poisoning.

When analysing the causes of diving sicknesses and accidents at the Diver and Scuba Diver Training Centre of the Polish Army, certain groups of additional factors were identified in the period between 1975 and 1976, which undoubtedly had a decisive influence on the occurrence of diving sicknesses and accidents:

1. malfunction of diving equipment.
2. Toxic effects of gases on human body during diving.
3. Organism defects (anatomical abnormalities, not found during commission examinations).
4. Technical errors of divers at work or during underwater training.
5. Minor injuries and the most common diving conditions are listed in Table I.

Tab. 1

Year	Ear barotrauma	Inflammation in the ear	Sinus barotrauma	Sinusitis	Respiratory congestion
1975	15	35	10	40	256
1976	10	33	5	32	275

According to the list, the most common injuries were those impacting the hearing organ and sinuses, and they were most common in beginner divers [1,2,3,4], who do not always properly implement theoretical diving knowledge when in a practical diving environment.

Particularly frequent mistakes are attempts to dive when it is not possible to perform the Valsalva manoeuvre [2], which often happens when the upper airways are blocked. Another common mistake made by novice divers is the sudden reaction to various unforeseen underwater situations resulting from a lack of familiarity with the aquatic environment.

A number of authors emphasised in their works [1,2] the fact that the incidence of upper respiratory tract congestion is higher in divers than in other groups of mariners. These situations can be explained by training conditions in various and difficult settings and more frequent contact with the water environment.

Of the typical diving conditions during the period covered by the analysis, the following occurred: pulmonary barotrauma, decompression sickness, CO₂ poisoning, oxygen (O₂) poisoning. Such a list is presented in Table II.

Tab. 2

Year	Pulmonary barotrauma	Decompression sickness	CO ₂ poisoning	Oxygen poisoning (O ₂)
1975	2	2	-	2
1976	3	-	11	-

Most of the cases of pulmonary barotrauma occurred in inexperienced divers and all of them were due to a rapid ascent from the depths whilst holding their breath.

Nearly all cases of pulmonary barotrauma took place during training sessions in deep pools.

Cases of decompression sickness (caisson sickness) were mild and occurred during diving at sea, in

one case there was a suspicion that alcohol consumed the day before the dive by the diver may have been a contributing factor to the incident.

All patients with pulmonary barotrauma and with decompression sickness were treated according to the appropriate regimes in high-pressure chambers with positive results. Treatment was carried out according to Soviet decompression tables [1].

The increase in CO₂ poisoning compared to the same period in the previous year was caused by faulty compressor operation (filter oiling).

CONCLUSIONS

1. It is necessary to discontinue the dive in the event that the diver is unable to perform the Valsalva manouver.

2. Instructors should constantly remind beginner scuba divers to release air as they surface.
3. In the event of diver ejection to the surface or poisoning, it is mandatory to refer the diver to a medical examination or hospital observation.
4. During training in the chambers, it is essential to strictly observe the decompression stations according to the decompression table.
5. Diving after drinking alcohol is not allowed.

REFERENCES

1. Dolatkowski A., Ulewicz K.: „Diving physiopathology outline”. PZWL. Warszawa 1973;
2. Kierznikowicz B.: „Cases of drowning among scuba divers”. V Symp. Pom. Dorażnej. Słupsk. 22-24. IX. 1972;
3. Macka J., Roguski W., Roszczyńko W., Zawidzki W., Zinserling A.: „Diver's manual”. CRZZ, Warszawa 1968;
4. U.S. Navy Diving Manual, Waszyngton, 1970.

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