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A PRE-DIVE CHECK; AN EVALUATION OF A SAFETY PROCEDURE IN RECREATIONAL DIVING: PART 1.

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Abstract

In this study divers were asked to do a pre-dive equipment check on some diving equipment (buoyancy jacket, regulator, air cylinder, contents and depth gauges) that had been assembled so that there were 9 faults to be detected. Only two out of the 55 divers who participated detected all faults. If these divers are representative of recreational divers then an adequate pre-dive equipment check is not being performed by divers.

Introduction

Diving is an equipment orientated sport so a pre-dive equipment check is an essential part of dive preparation and safety.[1-3] Failure to do an adequate pre-dive equipment check is an important contributing factor in the incidents reported to the Diving Incident Monitoring Study[4] and its preceding pilot study,[5] however, accident and fatality data fail to implicate a lack of a pre-dive equipment check as a contributing factor to recreational diving morbidity or mortality.[6,7]

A study was designed to test the thoroughness of the average diver's pre-dive equipment check.

Method

Divers who attended an annual dive equipment exhibition were asked, at random, to perform their "normal" pre-dive check on some diving equipment (buoyancy jacket (BCD), air cylinder, regulator with octopus, contents gauge and depth gauge with maximum depth indicator) which had been assembled incorrectly to contain nine equipment faults that had been noted in the incidents reported to the Diving Incident Monitoring Study (DIMS). The divers were asked to record their results. No information was given about the number of faults and there was no time limit for performing the check, but the time taken was noted by an observer (the author). The diver's qualifications were not asked for.

The nine faults are listed in Table 1. Four interfered with the air supply and regulator. These were that the air cylinder was empty , the outlet valve had not been opened, there was tape across the pillar valve outlet and the regulator mouthpiece was torn. Four faults affected the functioning of the BCD. These were that the power inflator was not connected, the inflator hose mouthpiece was torn and loose, the dump valve was loose and the air cylinder was loose in its harness. Finally the maximum depth indicator was not zeroed.

TABLE 1

THE NINE FAULTS

The air was not turned on
The tank was empty
Masking tape had been left on the pillar valve
The regulator mouthpiece was partially bitten through
The tank was loose in the harness
The buoyancy jacket's emergency dump valve was loose
The power inflator was not connected
The oral inflator was torn and loose
The maximum depth indicator was not zeroed

Results

Fifty five divers checked the equipment. Table 2 shows the number of divers and percentage detecting the various faults. The fault most commonly detected was disconnection of the power inflator which was detected by 47 (85%) of divers.

The time taken to complete the check varied between 2 and 10 minutes with the average being 5 minutes.

Only two divers identified all the faults, 4 divers detected 8 faults and, most alarmingly, 4 divers failed to detect any fault.

Forty two divers noted that the tank was switched off but only 23 of these noted any additional air supply problems. Seven divers noted all the faults with the air supply but only 4 of these noted the regulator's torn mouthpiece. Three divers noted the empty tank, that the air supply was switched off and the faulty BCD dump valve.

Eight divers identified all the buoyancy jacket's faults.

Twenty divers noted that the maximum depth indicator was not zeroed.

TABLE 2

FAULTS IDENTIFIED BY ¡55 DIVERS

Faults Detected by divers	Number	%
Air supply and regulator		
Empty tank	16	29
Air not turned on	42	76
Pillar valve tape still on	16	29
Torn regulator mouthpiece	17	31
Buoyancy jacket		
Power inflator not connected	47	85
Inflator hose mouthpiece	10	18
Emergency dump valve	12	22
Tank loose	33	60
Depth gauge		
Maximum depth indicator not zeroed	20	36

Discussion

Anecdotal data suggest that the average time taken to do a pre-dive check in this study was longer than the time taken to do an "on site" pre-dive check.

These results are disturbing for only 2 divers noted all the faults, only 3 noted the faults that could have potentially fatal consequences (the empty tank, the air supply switched off and the loose dump valve) and that only 14 noted the inadequacy of the air supply. Accident and incident data have shown that morbidity and mortality are associated with inaccurate depth gauges and rapid changes in buoyancy caused by buoyancy jacket problems[5-8] and the majority of divers in this study failed to notice the faults with either the buoyancy jacket or depth gauge.

Ninety six percent of the divers tested did not perform an adequate pre-dive check on the equipment, in particular, how to check the adequacy of an air supply and how to check to see if a buoyancy jacket and depth gauge will function correctly. If these divers could be considered as being representative of recreational divers, because they showed the motivation to attend a diving equipment exhibition that charged an entrance fee, then these data have the obvious safety implication that the majority of recreational divers do not adequately check their equipment before use. With the prevalence of a "failure to check" in diving incidents[4,5,8] an easy to remember, simple guide or a written pre-dive check list is needed. Once devised then its thoroughness will need to be tested.

References

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CARBON MONOXIDE: FROM TOXIC POISON TO BRAIN MESSENGER

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Introduction

Carbon monoxide (CO) is the most common lethal poison in every community that has been studied.[1] Although many of these poisonings are the result of a deliberate exposure to commit a suicide, toxic exposures to CO are also often the result of both domestic and industrial accidents.[2] In Western societies, the motor vehicle is the major source of CO.[2] Survival after poisoning with CO is frequently associated with neuropsychological deficits, and especially with problems in short-term memory and mood.[3-7] Despite this mortality and morbidity, the toxic mechanisms and the ideal treatment of CO poisoning remain controversial. The received version of CO toxicity is based on hypoxia,[5] and the majority of treatment algorithms are consequently designed to restore blood oxygen content.[5] However, the hypoxic theories of CO toxicity are seriously flawed and when treatment of poisoned patients has been essentially titrated against blood