

Brief Report

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Brief Report

Swiftwater Breathing Apparatus: Disrupting the Drowning Process and Mitigating Rescuer Fatalities

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Abstract: Drowning is a leading cause of accidental death worldwide, with traditional drowning prevention strategies focused on buoyancy aids and protective equipment proving insufficient in mitigating the immediate risks of cold water shock and drowning. Swiftwater Breathing Apparatus (SWBA) has emerged as a potential game-changer, offering respiratory protection at the water's surface and a means of interrupting the drowning process. This report examines how SWBA can disrupt the drowning process, the benefits of using SWBA compared to existing protective equipment, the issue of water rescuer fatalities, and the potential implications for insurers and coronial inquests.

Keywords: flood; scuba; diving; swiftwater; rescue; safety; drowning

Introduction

Drowning is a major public health concern, with an estimated 295,000 deaths occurring worldwide each year (Franklin et al., 2020). Traditional drowning prevention strategies have focused on buoyancy aids like personal flotation devices (PFDs) and protective equipment such as helmets. However, these measures do little to mitigate the immediate risks of cold water shock and the drowning process itself (Glassey, 2023). Swiftwater Breathing Apparatus (SWBA) has emerged as a potential solution, offering respiratory protection at the water's surface and a means of interrupting the drowning process.

Disrupting the Drowning Process

The drowning process involves a sequence of events, including struggle to keep the airway clear of water, initial submersion and breath-holding, aspiration of water, unconsciousness, and cardio-respiratory arrest (Tipton & Montgomery, 2022). SWBA can interrupt this process at critical points:

1. Maintaining a clear airway: SWBA provides a means to maintain a clear airway even if submerged or engulfed by water, preventing the initial struggle to keep the airway clear (Glassey, 2023).
2. Mitigating the gasp reflex: The gasp reflex, triggered by sudden skin cooling on immersion, can result in involuntary aspiration of water (Tipton & Montgomery, 2022). With SWBA, the operator can quickly access the mouthpiece to provide breathable air, preventing aspiration during the initial cold shock response.
3. Preventing water aspiration: Aspiration of water leads to worsening hypoxia, unconsciousness, and eventually cardio-respiratory arrest (Tipton & Montgomery, 2022). By preventing water aspiration, SWBA can delay the onset of these later stages of the drowning process.

Benefits of SWBA Compared to Existing Protective Equipment

While PFDs and helmets provide important protection, they do not address the immediate risks of cold water shock and the drowning process (Glassey, 2023). SWBA offers several key benefits:

1. Respiratory protection: SWBA provides a means to breathe while submerged, reducing the risk of water aspiration (Glassey, 2023).

2. Increased rescue time: SWBA provides additional time for self-rescue or assisted rescue, increasing the chances of survival (Glassey, 2023).

3. Compatibility with existing equipment: SWBA can be used in conjunction with PFDs and helmets, enhancing overall safety (Glassey, 2023).

Water Rescuer Fatalities and SWBA

Bystanders who attempt to rescue drowning victims often become victims themselves, a phenomenon known as aquatic victim-instead-of-rescuer (AVIR) syndrome (Turgut & Turgut, 2012). Studies have shown that a significant proportion of drowning incidents involve would-be rescuers (Turgut & Turgut, 2012; Zhu et al., 2015).

SWBA could potentially reduce the risk of rescuer fatalities by providing respiratory protection and increasing the chances of successful rescue. As awareness of SWBA grows, it is possible that future coronial inquests into rescuer fatalities may start to question why rescuers were not supplied with SWBA.

Implications for Insurers

As the benefits of SWBA become more widely recognized, insurers, particularly in the US market, may start to exclude cover for incidents where SWBA was not used. This follows a pattern seen in other industries, where insurers have mandated the use of specific safety equipment or risk management practices as a condition of coverage (Viscusi, 1993).

Conclusion

SWBA represents a significant advancement in swiftwater rescue, offering a means to interrupt the drowning process and potentially reduce the risk of rescuer fatalities. As awareness of SWBA grows, it is likely that its use will become more widespread, with potential implications for coronial inquests and insurance coverage. Further research is needed to quantify the effectiveness of SWBA in real-world scenarios and to develop best practices for its use in swiftwater rescue operations.

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