LOSS OF CONSCIOUSNESS IN BREATH-HOLDING SWIMMERS

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Although the phenomenon now commonly called shallow water blackout or hyperventilation-induced hypoxia has been known since the early 1960s, swimmers today still fall victim to it. [1] Counterintuitively, this entity is often found in experienced and dedicated athletes who practice prolonged breath-holding and can take this to the extreme of losing consciousness.

It is accepted that this problem is related to abnormal oxygen and carbon dioxide levels in the blood.

As we exercise, our body consumes oxygen and thus the oxygen level decreases in our blood, but it is actually the rising carbon dioxide level in our blood that initiates our drive to breath. If we ignore this urge to breath, triggered by our elevating oxygen level, our oxygen level can fall to the point that we are not getting oxygen to vital organs such as our brain, which can lead to unconsciousness and even death.

Some athletes learn to trick their body into postponing the stimulus to breath by hyperventilating prior to going underwater. Hyperventilation (faster or deeper breaths) appears to play a key role in loss of consciousness and death because, although it increases the swimmer's level, it more importantly decreases their carbon dioxide level at the beginning of the breath-holding drill, therefore causing an unnatural delay in reaching the elevated carbon dioxide level that is needed in order to reflexively remind the swimmer to breath.[2] If the swimmer does not breath, their blood oxygen level will fall too low and they will lose consciousness.

Hyperventilation can be voluntary or involuntary (related to excitement/anxiety), but either form can have a negative outcome. Debates will continue as to whether any breath-holding should be allowed in aquatic sports, but based on the current knowledge it is agreed that hyperventilation should be avoided and nobody should swim alone.

There are other risk factors that can be implicated besides hyperventilation (i.e. cardiac arrhythmias), but they are not as common. Further, we should all come together in producing an awareness of loss of consciousness in breath-holding swimmers, water polo players, divers, etc., so we do not lose any more lives that could have been saved.

1. Craig AB Jr. Causes of loss of consciousness during underwater swimming. J Appl Physiol. 1961; 16(4):583-6.

2. Pollock, NW. (April 25, 2014). Loss of consciousness in breath-holding swimmers. Retrieved from *http://ndpa.org/loss-of-consciousness-in-breath-holding-swimmers/*

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