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TRANSIENT GLOBAL AMNESIA TRIGGERED BY COLD WATER SWIMMING: A SERIES OF 9 CASES PRESENTING TO A HOSPITAL ON THE COAST OF IRELAND WITHIN 5 YEARS

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ABSTRACT

Background: Transient global amnesia is a clinical syndrome characterized by sudden onset of anterograde amnesia, often accompanied by repetitive questioning, lasting up to 24 hours with complete resolution and no other neurological deficits. This case series presents 9 patients who experienced transient global amnesia following sea swimming between 2019 and 2024 at Bantry General Hospital, a hospital located in a coastal town on the south of Ireland.

Case presentations: Patients who presented with "amnesia" or "transient global amnesia" were identified through searching the hospital database. Patients whose symptoms were directly related to sea swimming were included in this report. All 9 patients were women, with ages ranging from 55 to 82 years. Symptoms typically developed during or immediately after swimming, with durations ranging from 1 to 7 hours. Common symptoms included confusion, short-term memory loss, repetitive questioning and disorientation to time and/or place. Water temperatures ranged from 9.2°C to 18°C. Neuroimaging, including computed tomography scans of the brain for all patients and magnetic resonance imaging for 3 patients, showed no acute changes. All patients experienced full symptom resolution within 24 hours.

Conclusions: This case series highlights the link between cold water immersion during sea swimming and transient global amnesia. The consistent association with sea swimming aligns with previous reports identifying cold water immersion as a trigger for transient global amnesia. These findings warrant further investigation into the relationship between sea swimming and transient global amnesia. Clinicians should be aware of this potential trigger when evaluating patients with acute onset amnesia, especially in coastal areas.

KEYWORDS

Cold water exposure, sea swimming, transient global amnesia

LEARNING POINTS

- This case series highlights the link between sea swimming and the occurrence of transient global amnesia.
- With the increasing popularity of sea swimming around Europe, clinicians should be aware of this phenomenon.
- Further research is necessary to understand the underlying mechanism behind this phenomenon.

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INTRODUCTION

Transient global amnesia is a clinical syndrome characterized by the sudden onset of anterograde amnesia, often accompanied by repetitive questioning, lasting up to 24 hours with complete resolution and no other neurological deficits. It was first characterized in 1958 by Miller and Adams[1]. In 1990, a formal set of diagnostic criteria were defined by Hodges and Warlow[2]. There are several theories suggesting different aetiologies behind transient global amnesia. Various precipitating factors have been identified including cold water immersion[1]. Sea swimming is an activity that has increased in popularity over the past number of years. It has been linked to several positive health outcomes for its participants, including an increase in esteem and energy, and decrease the anger, tension and confusion of its participants[3].

This case series is based on patients who presented to Bantry General Hospital. Bantry is a small town on the south coast of Ireland. It is a popular tourist destination, well-known for its accessibility to the sea. Therefore, a number of people present with sea swimming-related conditions each year. This report documents 9 patients who experienced transient global amnesia following sea swimming between the years of 2019-2024. It highlights the link between cold water immersion and transient global amnesia.

CASE DESCRIPTIONS

Case 1: A 67-year-old woman presented with memory loss and recurrent vacant spells after sea swimming with family. The patient and her family entered the water at 10:00. The patient became confused while in the water, asking her family "What day is it" repeatedly. This repetitive questioning continued when out of the water. The family also noted the patient vacantly staring at blank phone screen when out of the water. These symptoms persisted throughout the day; therefore, her family called an ambulance. The patient became more lucid in the ambulance but could not recall the day's events. The patients' symptoms were fully resolved while being assessed in hospital at 23:45. Examination was normal with no neurological deficit. A computed tomography (CT) scan of the brain was unremarkable. The patient was discharged with no further follow-up.

Case 2: A 65-year-old woman experienced sudden onset short-term memory loss while sea swimming with a friend. She was asking unusual questions and was repeating herself. These symptoms lasted approximately 1 hour. The patient had a substantial medical history, but no history of transient global amnesia. During admission, examination was normal; there were no neurological deficit. CT brain was unremarkable. She was kept in hospital overnight for observation and was subsequently discharged. There was no further follow-up.

Case 3: An 82-year-old woman short-term memory loss and confusion after sea swimming. She had a background of previous stroke and shingles. The patient had gone sea swimming with her friends and family. She reported that after getting out of the water, she felt "foggy in her head… knew something wasn't right". A friend reported that the patient could not recall the swim, or the conversation they had before going into the water. She also could not find their car keys after the swim. When asked about the travelling she had done the previous week, and the travelling they had planned for the following week, the patient could not recall any details. She was assessed in hospital the following morning. During hospital assessment, patient could still not recall events of previous day. Examination was normal, no neurological deficit. CT brain showed no acute changes. The patient was subsequently discharged and asked to follow up with her general practitioner.

Case 4: A 64-year-old woman became disoriented during a sea-swim with her daughter. Her daughter first noticed the patient become disoriented after 5 minutes in the water; the patient asked her daughter what day it was. They spent 15 minutes in the water. After exiting the water, the patient was repetitive and confused about recent events, asking "how she got to the pier, when did she change into her swimming togs". The daughter drove the patient directly to hospital. During the patient's initial assessment, the patient was disoriented to time and place and was unable to recall the events of the day, including the events prior to the swim. These symptoms persisted for several hours while in hospital. The symptoms had resolved by the following morning. However, she did not remember any events of the previous day. CT brain showed no acute changes. Magnetic resonance imaging (MRI) of the brain showed no acute findings, mild microvascular disease.

Case 5: A 60-year-old woman experienced anterograde and retrograde amnesia post sea-swim. The patient last memory prior to swimming was at 11:00, when she remembered her husband leaving their home. At 13:00, she began ringing her husband, who described her to be acutely confused. She was later found at a local beach, where she reportedly had gone for a swim. On assessment, the patient was conversing normally. However, she repeatedly asked the same questions. On examination, the patient had no neurological deficit. The patient's symptoms lasted seven hours from approximate time of swim. CT brain showed mild frontal cerebral atrophy. There were no acute findings. MRI brain showed mild frontal cerebral atrophy and multiple small hyperintensities likely representing chronic ischaemic changes.

Case 6: A 69-year-old woman became confused and amnesic directly after sea swimming. The patient had gone swimming with her husband at 13:00. After exiting the water, the patient began asking unusual questions, including asking where they were. When asked, the patient was disoriented to time and place. She could not recall the swim. She stated afterwards that it was "like a nightmare". She was assessed in hospital 50 minutes after exiting the water. At this time, she was still disoriented to date and time. Her symptoms improved over the course of 6 hours. At 19:00, she was oriented to time and place, but did not remember the swim or subsequent CT scan. Mild age-related changes were noted on CT brain.

Case 7: A 61-year-old woman experienced acute onset

memory impairment after sea swimming. She rang her neighbour during afternoon stating that they had taken a "funny turn", and that she was at a local beach. When the neighbour arrived at the beach, the patient was sitting in a wet swimsuit. The patient was reportedly very repetitive, and had no recollection of being in the water, or even going to the beach. When being assessed in hospital 2 hours after being seen by her neighbour, the patient was alert and oriented to time and place. However, she repeatedly asked about her diagnosis. Examination was normal, with no neurological deficit. After 6 hours, the patient's symptoms had completely resolved. She received a CT brain as an inpatient, which showed no acute changes. As an outpatient, she underwent an MRI scan14 days after the event, which showed no acute changes. Outpatient carotid ultrasound showed "atheromatous change but no haemodynamically significant stenosis". Outpatient echocardiogram was normal.

Case 8: A 64-year-old woman became confused and amnesic after sea swimming. She on holidays with her husband. She went for a sea-swim with her husband at 17:00. She remembered thinking that the water was particularly cold, but her memory of the event was "foggy". According to her husband, he first noticed the patient becoming confused at 18:00, an hour after their swim. The patient could not recall place, date, or recent events. The symptoms lasted 90 minutes. She had a background of hypertension only. On assessment her examination was normal; there were no neurological deficit. CT brain was unremarkable. She was subsequently discharged, with advice to visit her general practitioner to consider further imaging and potential referral to neurology.

Case 9: A 55-year-old woman experienced confusion and memory loss after a brief sea swim with a friend. They stayed in the water for 3-4 minutes. Afterwards, she began repeating herself to her friend. The patient had 2 hours of missing time; she could not recollect the swim or events immediately before and after. Examination during admission was normal, no neurological deficit. CT brain showed no acute changes. She was placed on telemetry for the duration of her stay in hospital, which was unremarkable. An echocardiogram was performed 2 weeks after the episode and showed normal heart structure and function.

DISCUSSION

This case series presents 9 patients who experienced transient global amnesia like symptoms following sea swimming, particularly in cold water. All 9 cases meet the Hodges and Warlow criteria for transient global amnesia[2]. The consistent association with sea swimming aligns with previous reports identifying cold water immersion as a trigger for transient global amnesia[4,5]. Several hypotheses regarding the underlying pathophysiology of transient global amnesia have been proposed, including disruption of the hippocampal area and migrainous-like phenomenon causing cortical spreading depolarisation[6,7]. However, further research is needed to elucidate the cause in relation to transient global amnesia triggered by cold-water exposure.

Each of the patients presented in this case received similar workups. Included in the work up was blood tests, imaging of the brain (CT or MRI), and observation for several hours in hospital *(Table 1)*. This is in line with the recommended

Demographics	
Sex	All female (9/9)
Age range (years)	55-82
Mean age (years)	65.2
Symptoms	
During or immediately after swimming	6/9
Within an hour after swimming	1/9
Unknown onset (patient alone)	2/9
Duration of symptoms	
Range (hours)	1-7
Mean duration (duration stated in 7 cases, hors)	3.67
Common symptoms	
Confusion	9/9
Amnesia	9/9
Repetitive questioning	6/9
Disorientation to time and/or place	5/9
Water temperature	
Range (°C)	9.2-18
Mean (°C)	14.6
Medical history	
Cardiovascular issues	4/9
Demyelinating disease	1/9
Previous episode of confusion	1/9
Diagnostic imaging	
CT brain performed	9/9
MRI performed	3/9
Follow-up	
Discharged without specific plans	5/9
Advised GP follow-up or further imaging/referral	4/9

Abbreviations: CT, computed tomography; MRI, magnetic resonance imaging; GP, general practitioner.

Table 1. Characteristics and outcomes patients who experienced transient global amnesia after sea swimming.

investigations for patients with transient global amnesia[8]. Transient global amnesia is a benign condition, which rarely recurs. When following up with each of the patients in this series, none of them had further episodes of transient global amnesia. However, it is worth noting that 8 of the patients have not swum in the sea since having these episodes, and the only patient that has swam in the sea since has used a wetsuit when entering the water.

CONCLUSION

This case series highlights the link between sea swimming and the occurrence of transient global amnesia. While the exact mechanism remains unclear, the consistent association warrants further investigation. Clinicians should be aware of this potential trigger when evaluating patients with acute onset amnesia, especially in coastal areas. Future research should focus on elucidating the pathophysiological mechanisms underlying this phenomenon and potentially developing preventive strategies for susceptible individuals.

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