

Letters to the Editor

Electrocardiographic abnormalities in young athletes and scuba divers

Dear Editor,

I found the case report by Dr Acott of the sad death of a 17-year-old diver with a long QT interval most interesting.¹ I would like to offer some thoughts on this case. The electrocardiogram (ECG) in this normothermic diver shows a clearly prolonged QTc with notching on the R wave. This notching may well represent an intraventricular conduction defect; however, it may also represent early after-depolarisation occurring in the repolarisation phase of the action potential. This may trigger a spontaneous discharge and has been shown in dog Purkinje fibre models to initiate *torsades de pointes* ventricular tachycardia.²

In the context of diving-induced hypothermia, however, a similar ECG pattern may be seen with pronounced notching of the R wave, and the second wave may be as tall as the preceding R wave, with prolongation of QT interval and sinus bradycardia. This was described in 1953 by Osborn as an injury current, called a J wave, and may initiate ventricular fibrillation during experimental hypothermia. As the body rewarms, the Osborn waves diminish in amplitude and finally fade away.³

In both the normothermic and hypothermic rescued diving victim, confusion may further occur in those suffering with the autosomal dominant disorder due to mutations in the sodium channel (often SCN5A), described in 1991, and known as the Brugada Syndrome. The typically young South-East Asian or Japanese, with a structurally normal heart, develops nocturnal syncope due to non-sustained polymorphic ventricular tachycardia. The resting ECG shows a combination of an RBBB pattern in VI-3 with variable ST-segment elevation and a coved or saddle-type appearance.⁴ Therefore, a similar ECG abnormality to your case may be seen in a young, rescued Oriental diver.

My second point is the rising incidence internationally of sudden death in young athletes (aged less than 35 years) with, as you are aware, hypertrophic cardiomyopathy (HCM) being the most common cause. This young age group encompasses a great number of scuba divers throughout the world. For more than 30 years the Italian government, as a result of the Medical Protection of Athletic Activities Act, has mandated national pre-participation screening and medical clearance of all young athletes who participate in organised sports. This screening involves a 12-lead ECG. Since the ECG is abnormal in up to 95% of patients with HCM, this programme permits identification of many athletes with previously undiagnosed disease.⁵ The ECG also identifies other rhythm disturbances and, in particular, the long QT syndrome, as in this case study.

I am both a designated aviation medical examiner and an approved examiner for scuba trainees. I am sure that the value of an ECG taken at the initial medical screen would have been discussed in open forum at SPUMS meetings. However, I am not aware of the specific reasons advanced to exclude the ECG from the examination. This 17-year-old would have been denied a medical clearance for scuba diving had his ECG revealed the prolonged QT interval.

References

- 1 Acott CJ. Prolonged QT syndrome: a probable cause of a drowning death in a recreational scuba diver. *SPUMS J.* 2004; 34: 209-13.
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- 3 Short BH. Cold induced thermoregulatory failure: 1; Physiology and clinical features. *J Aust Mil Med Assoc.* 2000; 9: 29-33.
- 4 Gussak I, Antzelevitch C, Bjerregaard P, Towbin JA, Chaitman BR. The Brugada syndrome: clinical, electrophysiologic and genetic aspects. *J Am Coll Cardiol.* 1999; 33: 5-15.
- 5 Maron BJ. Sudden death in young athletes. *N Engl J Med.* 2003; 349: 1064-75.

*Air Vice-Marshall Bruce Short, RFD,
The Surgeon General Australian Defence Force,
66 Blackbutt Avenue,
Pennant Hills, NSW 2120, Australia
E-mail: <shortb7j@bigpond.com>*

Key words

Deaths, cardiovascular, prolonged QT syndrome, letters (to the Editor)

Survey of skin and scuba divers in the December 2004 Indonesian tsunami

Dear Editor,

We are conducting a world-wide Internet survey of skin and scuba divers who were in or on the water in the Indonesian Tsunami of 26 December 2004. There has been little or no published information regarding the effects of natural disasters on divers. Drs Tom Skalko and Carmen Russoniello of East Carolina University in Greenville, NC, USA and I are studying what that experience was like for divers and how it has affected their lives since then. We need divers to help us by completing the survey.

Some of the survey questions may be upsetting, even months after the Tsunami. It will take about 10 to 15 minutes to complete. The survey will automatically skip past questions that do not apply based upon answers to earlier questions. Results will be compiled and completed as a group only.

No individual identifying information will be released to anyone. The risks of participating in this survey are considered minimal.

If you or any skin or scuba divers whom you know were there in the Tsunami, please ask them to go to: <<http://www.zoomerang.com/survey.zgi?p=WEB2247GPQ5XL9>> to complete the survey.

David F Colvard, MD,
3725-228 National Drive,
Raleigh, NC 27612, USA
E-mail: <dcolvard@mindspring.com>
Web addresses: <www.DrColvard.com> and
<www.DivePsych.com>

Key words

Survey, trauma and stress, diving, underwater hazards

New requirement for the SPUMS Diploma of Diving and Hyperbaric Medicine

Dear Editor,

The SPUMS Committee have unanimously agreed that there should be a minor change to the SPUMS Diploma requirements. A 24-month SPUMS membership is now necessary before the Diploma will be awarded. This does not prevent any future candidate or new member of SPUMS from completing the Diploma within this time but means that the Diploma will not be awarded until 24 months' continuous membership has been completed. This change results from recent unreasonable demands on members of the SPUMS Academic Board, whose work is voluntary, in relation to the new ANZCA Certificate in Diving and Hyperbaric Medicine.

In addition, the SPUMS Committee is also considering that a condition of award is that SPUMS Diploma theses are to be published in the SPUMS Journal. As the Education Officer I proposed this change because the SPUMS Journal is indexed on EMBASE and in the near future we will be reapplying for Medline indexing. It is essential, in order for this to succeed, that the Journal publishes original work. Members' views on this move are sought.

Christopher J Acott,
Education Officer, SPUMS,
Royal Adelaide Hospital,
North Terrace, SA 5000, Australia
E-mail: <cacott@optusnet.com.au>

Key words

Medical society, qualifications, letters (to the Editor),

Maintenance of Professional Standards

Dear Editor,

The following Maintenance of Professional Standards (MOPS) points have been approved by the Australian and New Zealand College of Anaesthetists (ANZCA):

- 1 The 2005 SPUMS Annual Scientific Meeting (ASM) has been approved under Code 700 (other activities) for 38.5 CME and 7 QA points. The approval number for this activity is 0587.
- 2 The 2005 Undersea and Hyperbaric Medical Society (UHMS) Annual Scientific Meeting (ASM) in June has been approved as a Major CME Meeting under Code 111 for 3 CME points per hour. The approval number for this activity is 0580.

Jan P Lehm, Department of Diving and Hyperbaric Medicine, Prince of Wales Hospital, Randwick, NSW 2031, Australia
E-mail: <lehmj@sesahs.nsw.gov.au>

Key words

MOPS, letters (to the Editor)

The ocean storage of nuclear waste

One of the most daunting issues facing the global community is the storage of nuclear waste. The need to address this issue is urgent as the problems are severe and will continue to worsen. One potential storage option is deep, ocean storage, which, according to advocates, may provide important benefits compared to land-based storage.

Over the last decade, international research of nuclear waste dumped by the former Soviet Union in the marine environment in the Arctic is leading scientists to suggest that a comprehensive project plan, coordinated by a neutral third-party project manager, is needed to fully evaluate ocean storage of nuclear waste.

The various aspects of an ocean storage system are:

- isolating nuclear waste in very-long-life, total containment systems at 1,000 to 2,000 metres' depth on the ocean bottom
- continuous monitoring
- controlled accessibility for recovery and repackaging, if necessary
- replaceable by unforeseeable technology alternatives and storage systems developed in the future.

It appears there is a long way to go yet before this becomes a feasible and safe option for nuclear waste storage.

(Summary of a discussion article by Weldon C, *Sea Technology*. 2003; September: 29-33.)