MENSTRUATION – THE RISK OF DCI & SHARK ATTACKS

by **Lynn Taylor (PhD)**

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I was delighted to be asked to give a presentation on 'Women in Diving' as part of the DAN Dive Safety Workshop at the recent Dive Expo in Sydney. The presentation covered three main areas: Women pioneers in diving, Issues affecting female divers, and the future of women in diving. Over future issues of Viva Aqua I will provide a summary of the key points of the presentation regarding medical and safety issues affecting female divers, starting here with 'Menstruation - the Risk of DCI and Shark Attacks'. Future issues will cover 'Pregnancy and Breast Feeding' and 'Decompression Illness - Is being female a greater risk?'

The information has been compiled after reviewing the medical & scientific literature and the dive safety reports are available from Diver Alert Network. The aim was to present a balanced overview and general consensus of expert viewpoints, whilst accepting that, on many issues, we don't yet know all the answers.

If anyone would like me to present on 'Women in Diving' at one of your dive meetings, please contact me via the NZUA office.

The Menstrual Cycle and the Risk of Decompression Illness:

- Theoretically, the hormonal changes over the cycle can result in fluid retention and tissue swelling. This, theoretically, could affect tissue gas exchange behaviour, effectively making it a 'slower' tissue; however, this theory is not proven in practice.
- Some interesting early research has been done looking at the relationship between the incidence of altitude chamber decompression sickness in female chamber attendants at the UW Air Force School of Aerospace Medicine and phase of the menstrual cycle[(1)]. They concluded, "Women are at higher risk of developing altitude related DCS during menstruation, with the risk decreasing linearly as the time since last menstrual period (LMP) increases". The study was limited by not being able to look at other factors such as the influence of the oral contraceptives. Clearly, care must be taken regarding the relevance of extrapolating these observations in altitude chamber attendants, to divers in the underwater environment.
- As far as data in women divers is concerned, a group of researchers based in Plymouth, UK, coordinated the completion of a questionnaire by women who were treated with hyperbaric therapy for symptoms of DCI[(2)]. Twenty-three hyperbaric treatment centres worldwide participated in the study, including one in NZ (the Slark Unit at the RNZN Hospital, Auckland). They also concluded, "The incidence of DCI in women is influenced by the phase of the menstrual cycle. Incidence is greatest during the early phase of the cycle [ie: menstruation] and lowest around the third week of the cycle. The phase of the menstrual cycle had a greater influence on the incidence of DCI for women not taking the oral contraceptive pill compared with those taking the contraceptive pill."
- One recent retrospective view of women divers (956 divers) with DCI found 38% were menstruating at the time of their injury. Additionally, 85% of those taking oral contraceptives were menstruating at the time of the accident. This suggests, but does not prove, that women taking oral contraceptives are at increased risk of decompression illness during menstruation[(3)].

- What could the possible mechanism be? Oral contraceptives have been associated with an increase in blood pressure and an increased risk of thromboembolic disorders (development of clot-like vein occlusions, which can lead to an emboli), especially in women over 35 years. However, unless oral contraceptives pose a clinical problem for women, there is still no strong data to show that their use during recreational scuba diving is a contraindication.

Pre-Menstrual Syndrome (PMS)

- Research has shown that accidents in general are more common among women during PMS. If women suffer from premenstrual syndrome, it may be wise to dive conservatively during this time. There is no scientific evidence, however, that they are more susceptible to decompression illness or dive injuries / accidents.
- Interestingly, one large survey of divers has revealed that 7% of women chose to refrain from diving whilst they were menstruating and 12% said they dived more conservatively. In this survey a high proportion of women, almost three-quarters, reported that they do sometimes get PMS symptoms. Their self-perception was that they feel more tired, felt colder, had impaired reaction times, experienced more anxiety, felt more susceptible to nitrogen narcosis and felt less in control[(4)].
- Sensible advice would appear to be - if you are notably affected by these symptoms, take extra care in diving and dive more conservatively than you would normally.

Are Women at an Increased Risk of Shark Attacks during Menstruation?

- There are few reported shark attacks on women, and there is no data to support the belief that menstruating females are at an increased risk for shark attacks.
- The average blood lost during menstruation is small (50-100mls) and occurs over several days, so just a few mls per dive. With the use of tampons, there is no external blood loss anyway. In reality, women are attacked by sharks far less than men are. Also, it is known that many shark species are not attracted to the blood and other debris found in menstrual flow and Dr Carl Edmonds has even speculated that this may be due to a repellent effect of some component in menstrual blood. In reality, the chance of being attacked during your menstrual period is probably far less that from activities such as spearfishing.

Conclusions:

- The limited data we have so far suggests it may be advisable for menstruating women to consider diving more conservatively, particularly if they are taking oral contraceptives. This could involve making fewer dives, shorter and shallower dives and making longer safety stops.
- Also, it may be prudent for women to dive more conservatively and carefully if they suffer from Pre Menstrual Syndrome.
- There is no evidence that women are more prone to shark attacks whilst menstruating.

References:

1. Rudge FW (1990). Aviat Space Environ Med: July; 61(7):657-9.
2. Lee, St Leger Dowse, Gumby, Bryson. A Presentation to the British Hyperbaric Association 2001.
3. DAN America website www.diversalertnetwork.org
4. St Leger Dowse M, Bryson P, Gumby A, Fife W, (1994). 'Men and Women in Diving' Diving Diseases Research Centre, UK.