



Depression & Diving: Part II. Making the call on recreational diving.

by DocVikingo

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In the March/April 2003 issue, Alert Diver took an in depth look at the nature, classification and treatment of depression, and briefly touched upon its implications for diving. In this follow up, we focus in detail on how the signs and symptoms of the condition, and their medical management, can impact safe scuba for the recreational diver and his buddy.

About one in 20 Americans show characteristics of a depressive disorder. And, because some antidepressants are used for other conditions as well, more than one in 15 takes such a medication.

As research suggests that the prevalence of depression in active divers does not significantly differ from that found in the general population, it is critical to understand what this disorder means for affected divers and the mental health professionals who treat them. During calendar year 2002, DAN Medical Services received 125-130 inquiries regarding diving with depression, and about an equal number specifically concerning the drugs used to treat it.

In a nutshell, depression is a disorder of mood. Sufferers complain of or are described by others as being down, blue, sad or empty, and as having reduced interest in or capacity to enjoy activities they once found pleasurable. Other features include disturbed sleep, changes in appetite and weight, feelings of

worthlessness, hopelessness and guilt, thoughts of doing away with oneself, lack of energy, easy fatigue, loss of libido, restlessness, irritability, and difficulty in paying attention, concentrating and making decisions. In addition, depressive episodes can alternate with manic ones. With the latter, there can be groundless or excessive feelings of well-being and happiness, racing thoughts, poor judgment, recklessness, and a tendency to be easily distracted.

Of course not every individual will have all of these, and the severity ranges from mild to requiring hospitalization. The disorder is treated both by psychotherapy and medication, and often responds best to the combination.

The decision to dive or not largely takes care of itself at either extreme of the severity spectrum. However, those cases falling in between can be vexing, especially when the disorder is to varying degrees controlled by medication.

Issues related to the disorder itself

Among common signs and symptoms, indecisiveness and poorly sustained concentration perhaps rank highest on the list of concerns. Tracking and managing variables such as one's depth, location, air supply, NDLs and buddy status requires a high level of vigilance and sound, smooth decision-making. Deep underwater is not a benign place to suffer lapses in attention and decisional sharpness.

Divers revel in those seemingly effortless dives where perfect neutral buoyancy is achieved as we ride a gentle current past expanses of colorful reef. However, the requirement for vigorous activity is often just around the corner in the form of a wicked down current or buddy in need of rescue. I would not like my energy level or resistance to fatigue, or that of my buddy, to be reduced during scuba, and this can be seen in depression

Things don't always go smoothly while diving, either above or below water. Boats can arrive late, be crowded, and have dictatorial crew. Once down, the diver can inadvertently brush up against fire coral, get snagged in fishing line, or have an inconsiderate diver spoil a special photo opportunity. If irritability, which is quite common in depression, rears its head at minor provocation you have a diver who is not in optimal control.

Consideration must also be given to suicidal thought, intent and plan. Up to 9 percent of suicides in regions with easy access to water are due to drowning, and scuba offers a ready mechanism for death, one that can look to all the world like an accident. While good statistics are not available for obvious reasons, it is known that suicide accounts for a number of scuba deaths. It has been estimated that suicide may be responsible for as much as 17 percent of the deaths of professional divers in the United Kingdom. And, although not conclusive, investigations of a number of high profile scuba deaths, such as those of an ophthalmologist from Wisconsin (in Wisconsin), a psychiatrist from Missouri (in Thailand) and a couple from Louisiana (in Australia), all prominently raised the issue of possible suicide.

Finally, some persons with depression complain of bodily discomforts that have no demonstrable physical cause, including headache and joint pain. As these also can be features of DCS, report of them post-dive could result in an inappropriate trip to the chamber.

Issues related to pharmacological treatment

Drugs are frequently used to treat depression, and this raises additional concerns. Divers taking any medication should routinely investigate reported side effects.

Commonly prescribed antidepressants include three major classes: selective serotonin reuptake inhibitors (SSRIs), tricyclics/tetracyclics/heterocyclics (TCAs/HCAs), and monoamine oxidase inhibitors (MAOIs), along with a few uniquely acting compounds.

In general, SSRIs are currently more popular than the others due to their relatively greater safety (including in overdose) and tolerability, although they do cost more. MAOIs tend to be less frequently prescribed, in part because their interaction with certain foods, beverages and medications can cause severe high blood pressure. Examples of each class can be seen in Table 1.

Table 1

Prescribed Antidepressants

SSRIs:

Celexa® (citalopram)
Luvox® (fluvoxamine)
Paxil® (paroxetine)
Prozac® (fluoxetine)
Zoloft® (sertraline)

MAOIs:

Nardil® (phenelzine)
Parnate® (tranylcypromine)

TCAs/HCAs:

Adapin®, Sinequan® (doxepin)
Aventyl®, Pamelor® (nortriptyline)
Elavil®, Endep® (amitriptyline)
Ludiomil® (maprotiline)
Norpramin®, Pertofrane® (desipramine)
Remeron® (mirtazepine)

Others:

Desyrel® (trazodone)
Effexor® (venlafaxine)
Wellbutrin®, (bupropion)

Although the risk is very low, perhaps most worrisome is that the majority of medications prescribed for the condition have been shown to be associated with seizures, most particularly the SSRIs at high doses. The almost certain lethality of a convulsion underwater requires that serious attention be paid to this finding.

A second disturbing effect is drowsiness and reduced alertness, an adverse reaction known to occur with a number of antidepressants, notably the TCAs/HCAs. The SSRIs have this problem as well. Thirteen percent of patients with major depression treated with the world's most widely prescribed antidepressant (an SSRI) reported sleepiness, while research studies have demonstrated that such drugs can lead to decreased vigilance. Their effects can hinder higher cognitive functions as well, such as ability to master complex spatial tasks and to recall information learned a short while earlier.

Obviously, these medications impact on brain chemistry at ambient atmospheric pressure. It is not unreasonable to suspect the possibility that their effects could be potentiated by increased partial pressures of nitrogen and additive with those of nitrogen narcosis.

Drowsiness, dizziness, concentration disturbance and deficits in more complex cognition are among the reasons that package inserts for antidepressants contain warnings that the drug may impair the mental and/or physical abilities required for the performance of hazardous tasks, such as operating machinery or driving a car (and scuba?). The addition of medication-induced compromises of alertness, concentration and decision-making efficiency to impairments of these functions caused by the depression itself is quite troubling given a multitask recreation like scuba.

Several studies suggest that increased brain levels of serotonin correspond with increased levels of fatigue during exercise, under some conditions diminishing endurance by as much as 32 percent. Again, adding deficits in stamina caused by SSRIs to those already inherent in depression could spell disaster in a scuba emergency.

An unusual and typically mild but nonetheless worrisome side effect of certain drugs used to combat depression, notably the SSRIs, can be a tendency toward increased bleeding. During scuba, blood vessels in the ears, lungs and sinuses are subject to strain as a result of changes in pressure related to depth and equalization techniques. What under normal circumstances might be undetectable bleeding could under the influence of antidepressants result in bleeding with accumulation and harm to tissues. And, this bleeding is not always obvious or painful; in fact can be hidden and painless. If the diver is also taking other drugs known to interfere with clotting, such as non-steroidal anti-inflammatories like aspirin and ibuprofen, there is a further increase in the risk of bleeding.

Side effects of some antidepressants can mimic DCS. All classes of antidepressants have shown adverse reactions involving the central nervous system such as headache, weakness and fatigue, dizziness, incoordination, abnormalities of vision, and numbness and tingling of the extremities.

The above discussion of medication could leave one with the impression that taking antidepressants automatically sinks the diver under the weight of adverse reactions. This is not necessarily the case. Many persons who take these drugs tolerate them well, and what side effects they do experience pass after several weeks of use. Moreover, altering dose size, the times at which doses are taken, and other steps sometimes can manage persistent side effects. Finally, the wide variety of available antidepressants allows the diver and his doctor to try different ones until adverse reactions are minimized.

Still, these are medications and they will have enduring, problematic side effects in some persons. As such, each individual must carefully monitor how or he responds to a prescription over time before engaging in activities for which side effects could pose a risk.

What can we prove?

Frankly, next to nothing. Sadly, there has been exceedingly little investigation of how depression and antidepressant drugs really affect the diver.

One animal study has suggested that increased serotonin levels related to SSRIs may contribute to high pressure nervous syndrome, a disorder sometimes seen in very deep dives on helium mixes but of very minimal relevance to the recreational diver. And, while it might be expected that chemicals that stimulate the brain (like serotonin and caffeine) could predispose to oxygen toxicity, a study on rats found that caffeine in fact reduced the risk.

There is only a single study I am aware of that assessed the interaction between a drug that acts on the human brain and the effects of partial pressures of nitrogen typical of recreational scuba. This involved dimenhydrinate (e.g., Dramamine Original Formula®), and demonstrated impaired alertness & performance. Although dimenhydrinate has been shown to interact with certain neurochemicals known to affect mood, including serotonin, norepinephrine and dopamine, the exact mechanism of its effects under increased partial pressures of nitrogen is not entirely understood.

Where does this leave the recreational diver with depression and those advising him about safe scuba?

There appear to be 3 basic approaches to this question:

1. Assume that depression and the drugs used to ameliorate it do not pose a danger to scuba great enough to advise against diving:

This position is not defensible given what we know about the topside dangers of both depression and antidepressants. Because of a dearth of research and necessary reliance on theory, a number of dive medicine experts have expressed serious reservations about the wisdom of diving while suffering from depression, especially while medicated. The phenomenal popularity of modern antidepressants and their wide prescription by physicians not expert in their use suggests a somewhat cavalier attitude about these medications. Such an attitude can have grave result when it comes to pursuits like scuba.

2. Assume that depression and the drugs used to ameliorate it pose a danger to scuba great enough to advise not diving until the condition has entirely lifted and medication discontinued:

Qualified medical professionals rendering their best judgment in the absence of supportive science should not be too readily faulted for possibly erring on the side caution. Liability issues no doubt contribute to this stance, but at the least it does seem prudent and ethical medicine, whose overarching dictum is, "First, do no harm."

Along this line, in May 2001, based on a manufacturer reported seizure frequency of .4 percent at the highest recommended dose, the UK Sport Diving Medical Committee specifically advised against diving while using Wellbutrin®, deeming the risk "grossly excessive." It also made this recommendation regarding Zyban®, an aid to smoking cessation treatment that contains the same advised against diving."

While it could be argued that this position is unduly conservative, it is not without a defense.

3. Assume that depression and the drugs used to ameliorate it do not preclude diving provided that: (a) mental status examination demonstrates the condition to be well controlled; (b) the diver on medication has been on for an extended period and side effects dangerous to scuba are neither reported nor observed upon careful examination; (c) there are no other contraindications in the clinical picture; and, (d) the diver feels he is up to it and fully comprehends the remaining risks.

I suspect that most divers will find this latter perspective the most appealing, and it is the one I'd want applied to myself if ill. It also seems to be gaining interest in the dive medicine community. A version appears on Diving Medicine Online (also reproduced in part as a DAN Diving Medicine Article). Dr.

Campbell's position on fitness to dive in persons with depression is that decisions be based on the "merits of each case." This includes considering "... the type of drugs required, the response to medication and the length of time free of depressive or manic incidents" and "... decision-making ability, responsibility for other divers, and drug-induced side effects that could limit a diver's ability to gear up and move in the water." He goes on to say that, "Most, particularly those divers who have responded well to medications over a long term, probably could receive clearance to dive."

In any such deliberation, it is important that the diver be entirely honest with treating sources, training agencies, dive ops and himself.

The jury is still out. For the foreseeable future, decisions on the recreational diver with depression will remain individual determinations meager of science and rich of professional judgment."

[DocVikingo is presently a regular contributor to Undercurrent, and in the past wrote a monthly column for Rodale's Scuba Diving. A mental health professional in the greater Washington, DC area for over 25 years, he made his first dive with a double hose regulator and no BC.]

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Diving Medicine Online (<http://scuba-doc.com>)

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