CASE HISTORIES AND SHORTER COMMUNICATIONS

On the termination of panic attacks
A reply to Ley

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Several authors believe that a hyperventilatory positive feedback loop lies at the heart of panic attacks (e.g. Ley, 1985). During the attack, the patient is assumed to hyperventilate; hyperventilation produces bodily symptoms that arouse fear; fear leads to a further increase of ventilation etc. Several recent studies show evidence that hyperventilation may not account for (most) panic attacks (Roll, 1987; Hornsveld, Garssen, Fiedldij-Dop & van Spiegel, 1990; Hibbert & Pilsbury, 1987; van den Hout, Hoekstra, Arntz, Christiaanse, Ranschaert & Schouten, 1992; Bass, Lelliott & Marks, 1989). However, if it is accepted that a hyperventilatory positive feedback loop plays a crucial role in (a minority of) panic attacks one wonders why such attacks do not last till the day of judgement, but run a time-limited course.

To elucidate this issue, we asked 20 healthy volunteers to forcefully overbreathe for no shorter than 90 min. At regular intervals, they were asked to report bodily symptoms characteristic of panic attacks. Initially, Ss reported many and intense sensations. Over the course of time, and despite persisting extreme hyperventilation, both saliency and presence of symptoms steeply declined. We concluded that adaptation and/or habituation are responsible for the waning of symptoms during hyperventilation and suggested that the same processes may be responsible for those clinical panics in which feared sensations result from hyperventilation (van den Hout, de Jong, Zandbergen & Merckelbach, 1990).

In our 1990 paper we introduced the experiment by stating that “hyperventilatory positive feedback theories leave unexplained how and when panics come to an end”. Focusing on this remark, Ley (1992) cites 5 papers by Ley (Ley, 1985, 1986, 1987a,b, 1988) convincingly demonstrating that he did try to explain the termination of panic attacks in terms of a hyperventilation theory. This, of course, refutes any suggestion that no one has ever tried to reconcile hyperventilation theory with the observation that panic attacks are time-limited. Yet, suggesting an explanation for a phenomenon is one thing, testing its credibility is surely another. We think Ley’s arguments are not convincing.

According to Ley, hyperventilation attended panics come to an end in 4 ways. (I) Prolonged hyperventilation will affect excitability of muscle and nerve cells thereby “debilitating” (intercostal) muscles. (II) The reduced pCO2 will “ultimately” become insufficient to stimulate the respiratory reflex centre. (III) CO2 levels will acutely be restored once the patient starts to do rigorous exercise. (IV) Elsewhere (Ley, 1985), it is claimed that prolonged hyperventilation is lethal, but that “death is forestalled, however, by loss of consciousness and subsequent decrease in respiration rate”. Let’s have a closer look at the negative feedback mechanisms proposed by Ley. Add(I) Following this argument, one would expect hyperventilation to become harder the longer it lasts. This is the opposite to what we observed. The longer hyperventilation lasted, the less effort was needed to keep CO2 low (van den Hout et al., 1990). Add(II) By definition hyperventilation reduces arterial pCO2. This “hypoapnia” does not “eventually” produce understimulation of the chemoreceptors, but it does so immediately. If understimulation of chemoreceptors is responsible for termination of hyperventilation it becomes unclear why any hyperventilation attack lasts longer than a couple of seconds. Add(III) By increasing metabolic rate, vigorous exercise will, indeed, compensate for the hyperventilation induced pCO2 drop. However, such a motoric response to panic feelings is extremely unusual (patients seem to do the opposite and restrict motoric activity when panicising). Add(IV) It is assumed that if extreme hyperventilation were to continue, it is only loss of consciousness that prevents death. All our Ss hyperventilated to a degree that is about the maximum that human Ss can accomplish (i.e. reduction of pCO2 with 55% and they did so for 1½ hr). None of them fainted and none of them died.

In sum, we acknowledge the fact that in various papers Ley addressed the question of how panic attacks end and we agree that the problem is important. We disagree about his answers: he thinks they are sound and we think they are not.

REFERENCES


