Swimming Headache Followed by Exertional and Coital Headaches

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Seven patients who developed a similar headache syndrome are described. They first developed severe, exploding headaches while swimming, and subsequently experienced less severe headaches during physical exertion. They also developed headaches during sexual activity, which were similar to the previous headaches brought on by swimming. Majority of them were women in their thirties or forties. These symptoms were gradually subsided with or without medication after several weeks or months. The possible pathogenesis of this headache syndrome is discussed.

Key Words: headache, swimming, exertion, coitus

INTRODUCTION

A headache occurring during physical exertion without evidence of significant brain pathology was named as 'benign exertional headache' (Rooke, 1968), or 'effort headache' (Meyer and Dalessio, 1987). Terms such as cough headache (Symonds, 1956), footballer's migraine (Matthews, 1972), runner's headache (Massey, 1982), and benign coital cephalalgia (Paulson and Klawans, 1974; Porter and Jankovic, 1981) have also been used to describe various headache-provoking conditions. However, reports of headaches provoked by swimming were rare (Lambert and Burnet, 1985; Indo and Takahashi, 1990). Indo and Takahashi (1990) recently reported three patients who developed migraine-like headaches which occurred exclusively during swimming. In this report, I present seven patients who developed severe headaches during swimming. Unlike the previous report, these patients experienced subsequent exertional and coital headaches for several weeks or months following the initial swimming headache. Two illustrative patients are described in detail, while others are briefly summarized in the Table 1.

CASE REPORTS

Case 1. A 41-year-old previously healthy woman de-

veloped a sudden, severe headache during butterfly swimming. She had intermittently attended a swimming class for 1 year, but had never experienced this kind of headache. She remembered that she had felt a shortness of breath just before development of the headache. The headache was generalized, and its nature was described as 'exploding', or 'crushing'. She did not feel that it was pulsating. The severe headache lasted about 5 minutes, which was followed by a less severe, but unpleasant dull head pain for 3 hours. Three days later, she again experienced a similar headache during swimming, which was associated with nausea.

Threereafter, she felt that she was in a 'headache prone state'; she experienced multiple episodes of brief headache lasting for a few minutes whenever she was under strenuous conditions such as defecation or lifting something. These headaches were pressing, steady, and usually over the occipital area. Similar headaches also developed when she stooped to wash her hair or tried to pick up material from a high shelf. In addition, two weeks after the initial swimming headache, when she had sexual intercourse, she experienced a very severe, generalized headache just before orgasm, which was accompanied by nausea and vomiting. Its nature was similar to the swimming headache described above, but was even more severe. The headache lasted about one hour, and then a less severe, diffuse headache continued all day long. She visited an emergency room the next day.

She denied a past history or familial history of migraine. She appeared healthy and the neurologic ex-

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Table 1. Summary of the patients

Patient No/Age/Sex	Swimming style Career	Nature of headaches (severity/location/type/duration/associated symptom)			Treatment Outcome	History of migraine
		Swimming headache	Exertional headache	Coital headache		
1/41/F	Butterfly 1 yr	Severe Generalized Exploding 3 hrs Nausea	Moderate Occipital Pressing A few minutes None	Severe Generalized Crushing Up to 12 hrs Nausea	Propranolol Good	No
2/44/F	Free style Novice	Severe Generalized Exploding 3 hrs None	Moderate Occipital Pricking A few minutes None	Severe Generalized Pulsating Up to 12 hrs None	Amitriptyline Good	No
3/44/F	Free style Novice	Severe Generalized Pulsating 2 hrs None	Moderate Generalized Pressing One minute None	Moderate Generalized Pressing A few minutes None	Propranolol Good	No
4/48/F	Free style Novice	Severe Generalized Pulsating Up to 12 hrs None	Moderate Migrating Pulsating A few hours None		Amitriptyline Moderate	No
5/39/F	Free style Novice	Moderate Occipital Pulsating 3 hrs None	Moderate Occipital Pulsating A few hours None	Severe Occipital Pulsating Up to 12 hrs Nausea	Propranolol Good	Yes
6/45/H	Free style Novice	Severe Occipital, Parietal Exploding 3-4 hrs None	Moderate Occipital Pressing A few hours None	Moderate Generalized Pulsating 3 hrs None	No treatment Good	No
7/35/F	Free style Novice	Severe Generalized Exploding 3 hrs None	Moderate Occipital Pressing A few hours None	Severe Generalized Exploding Up to 12 hrs None	No treatment Good	No

amination was normal. Her blood pressure and pulse were normal. Simple skull, C-spine films, brain CT and CSF findings were all normal. Propranolol 120 mg/day was administered. During the medication, she experienced several episodes of milder, tolerable headaches during sexual intercourse lasting about 2 hours. One month after the treatment, she became free

from coital or exertional headache even without medication.

Case 2. A 35-year-old woman who had attended a swimming class for one month suddenly developed a severe headache during free style swimming. The headache was generalized, exploding, and pulsating, and lasted for about 3 hours. Just before the begin-

ning of the headache, she felt a severe shortness of breath because she had tried free style swimming for about 25 meters without adequate respiration.

She denied past history of headache. After the incident, however, she felt that she was in a headache-prone state; she experienced waxing and waning headaches which became worse whenever she did not feel comfortable either mentally or physically. The dull or pulsating headaches were of moderate severity. While the location of the headache was variable, most often it was over the occipital area. After 10 days she became free of headache in her ordinary life. However, headaches still developed when she was under strained conditions, which included defecating, lifting, or yawning. One time, when she had sexual intercourse, she experienced a severe, longer-lasting headache (lasting all day long) just before orgasm. The headache was pulsating, but was not accompanied by nausea. At the outpatient clinic, neurologic examination as well as brain CT, C-spines were found to be normal. She became free of symptoms one month after the start of oral amitriptyline 20 mg/day.

DISCUSSION

This series includes 6 women and one man. They were in their thirties or forties with a mean age of 41. All were attending swimming classes, most of them beginners. The female preponderance is not surprising since in Korea, females far outnumber males in any swimming classes for adults. These 7 patients presented homogeneous headache syndromes: initial swimming-induced headaches followed by exertional headaches. In all cases, the former was the worst headache they had ever experienced, but the latter was usually less severe and of a shorter duration. All of them also experienced coital headaches although it was not known in Patient 4 who did not have sexual activity until the 8th months of follow up. Except Patient 3, the nature and severity of these coital headaches were similar to the swimming headache, that is, more severe and longer lasting than the exertional headaches. Negative neurological examinations, normal investigations including CT, and the benign clinical courses of these cases indicated that these patients did not have organic brain lesions.

The swimming headache our patients experienced was sudden, severe, exploding or pulsating. These characteristics are, according to previous reports (Paulson and Klawans, 1974; Porter and Jankovic, 1981; Indo and Takahashi, 1990; Lance, 1976; Kim, 1989), vascular in nature. Therefore, it seems plausible that some

vascular factors are involved in the pathogenesis of the swimming headache in our cases. It is noteworthy that none of the patients were professional swimmers in our series; the majority (6 cases out of 7) were novices in the swimming classes. Patient 2 developed the headache after she had swum free style for a relatively long distance (about 25m) without adequate respiration. Patient 1, who had been learning swimming for a relatively long time, also felt a shortness of breath just before the onset of the headache. It therefore seems that hypercapnia secondary to insufficient ventilation may be induced during swimming, which would then give rise to cerebral vasodilation and subsequent increment of intracranial pressure. In addition, prolonged Valsalva maneuver due to inadequate ventilation might also have induced an increment of intracranial venous pressure, further contributing to increased intracranial pressure.

Compared with the initial swimming headache, however, the subsequent exertional headaches were usually less severe and shorter in duration. They were dull or pulsating, but never exploding. The provoking conditions were usually physical efforts such as lifting, defecating, stooping, or neck flexion and extension. In addition, some patients complained of dull background headaches which fluctuated according to their mental as well as physical strain. These patients felt they went into a 'headache prone state' so that they were careful to avoid even trivial physical or mental stresses. It therefore seems likely that after episodes of swimming headache, our patients went into a period of time in which their headache threshold decreased.

In the literature, the patient described by Paulson (1983) showed a similar headache syndrome to ours. This patient, after developing a headache during weight lifting, experienced headaches whenever he sneezed, exercised or had orgasms until 5 months elapsed. The author speculated that strains or stretches of the cervical ligaments during weightlifting could be responsible for these headaches. This mechanism may also be applied to our patients. However, as mentioned above, extreme vascular dilatation either due to hypercapnia, or cerebral venous engorgement by prolonged Valsalva maneuver (or both together) seems more likely to have affected the vessel wall or surrounding dura, both of which are classical pain sensitive structures (Moskowitz, 1990). The involvement of these structures would reduce the pain threshold allowing subsequent exertional headaches to develop whenever increased intracranial pressure was induced.

Finally, in our series, the coital headaches were also vascular in nature, closely resembling the previous

swimming headache. As noticed by Litter et al. (1974), coitus can produce extremely elevated blood pressure and consequent increased intracranial pressure. Furthermore, as when swimming, the respiratory pattern could be disorganized during sexual excitement providing a state of repeated Valsalva maneuver which may further increase cerebral venous pressure. These multiple mechanisms may not only explain the similarity between the coital and the swimming headache, but may also provide an answer as to why these two were more severe and longer lasting than other exertional headaches our patients experienced.

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