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Do people with anorexia nervosa use sauna baths? A reconsideration of heat-treatment in anorexia nervosa

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Abstract

The paper addresses the absence of reports about the sauna use among the weight loss strategies of patients with anorexia nervosa (AN). Because AN entails a relentless pursuit of thinness, it might be expected that these patients would frequently resort to saunas. The paper sustains that the absence of reports should not be taken to mean that sauna use is irrelevant to AN. Support for this possibility is founded in the apparent progress shown by AN patients whose treatment consisted of different strategies of heat supply, which included a protocol of sauna sessions. First recommended by W. Gull, heat-treatment may be relevant to hyperactivity, a significant clinical characteristic in AN. This treatment was developed as an extrapolation from animal research model, where a simple manipulation of ambient temperature (AT) was found to impede and reverse excessive running in food-restricted rats. Sauna use may have been unreported either because it impedes the development of the syndrome, or its benefits have been attributed to conventional treatments. The elucidation of sauna experience among AN patients may have potential implications for the role of heat in the treatment of AN. © 2002 Elsevier Science Ltd. All rights reserved.

Keywords: Anorexia nervosa; Excessive exercising; Heat treatment; Hyperactivity; Sauna; Thermoregulation; Vasoconstriction; Weight-loss strategies

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1. Introduction

People with anorexia nervosa (AN) resort to a surprisingly diverse range of strategies to induce weight loss, including extreme dieting, vomiting, ingestion of laxatives, diuretics, and strenuous exercising (American Psychiatric Association, 1994). As it is commonly known that taking saunas is an effective means of losing weight (fluid loss), a high number of reports of sauna use amongst people with AN would be expected. However, the result of a systematic search in PsycLIT since 1868 (American Psychological Association, 2000), and Medline databases, since 1970 (Medline, 2000), crossing index terms like anorexia nervosa, eating disorders, and weight loss strategies with sauna, baths, steam, and heat yielded only two references. Neither of these related to AN. One referred to sauna abuse amongst people with bulimic conditions (Mitchell, Pyle, & Eckert, 1991), and the other was a descriptive study evaluating the presence of bulimic weight loss behaviors in individuals enrolled in a military weight-management program (Peterson, Kelleher, Talcott, & Smith, 1995).

At first glance, the absence of reports seems to indicate that people with AN do not use sauna baths as a weight-losing strategy, or at least that their use is very uncommon. The absence of reports would be less striking if AN were a disease most common in tropical countries, but actually AN is more likely to occur in temperate or cold geographical areas, where saunas are readily available.

The absence of commentary in the literature may be due to several possibilities: either people with AN selectively avoid saunas, or sauna use has gone unreported. The aims of this paper are to discuss the absence of reports, to explore other leads in assessing the role of heat in AN, and to describe its use in treatment in an uncontrolled study of our own.

2. Why the absence of reports concerning sauna use in AN?

The first possibility is that the absence of reports is simply due to the “fact” that people with AN actively avoid taking saunas. If this were the case, one would query why anorexics do not use this as an obvious and well-known weight-loss strategy. While it is true that a sauna will only effect weight loss because of change in hydration (Kauppinen, 1997), this is equally true of other anorexic strategies such as diuretic and purgative abuse.

An alternative possible explanation may be that people with AN actively avoid saunas because they cannot withstand the hot environment of the sauna due to their hypotension, i.e., they would faint before reaching the threshold for perspiring and adverse reactions would deter any further use. However, should this be the case, it is remarkable that there are no reports of the adverse effects or casualties of sauna use amongst this population. A further explanation might be that people with AN are deterred from sauna use because this entails full or at least partial nakedness in the company of other people. Yet many sauna users avoid public nakedness by the use of towels, or by employing private or home saunas, ensure some degree of intimacy and isolation. Whatever the case, hypotension and public scrutiny are two plausible but tentative reasons for supporting the view that lack of sauna reports in people with AN is due to the fact that they do not take saunas.

Alternatively, people with AN may indeed use saunas, and this is simply underreported. It seems plausible to believe that, if normal people with external pressure to lose weight make use of the sauna (Peterson et al., 1995), people with AN, who are even more motivated to lose weight, should do likewise. In conclusion, we postulate that the absence of reports is not equivalent to evidence that the practice is absent. In the second part of this paper, we postulate that there are several reasons why this practice may go unreported or undetected.

2.1. Sauna baths may act as a preventive measure

At first glance it would seem reasonable to believe that sauna use may help reduce weight in those at risk of AN. Paradoxically, however, sauna use may prevent these people from developing the full-blown syndrome and may accelerate their recovery. Thus, sauna use may be going undetected in those prone to AN because they never become severely ill and are thus never diagnosed as such. This unexplored possibility is made conceivable by the complementary evidence that sauna use is not a risk factor associated to the development of AN, or other eating disorder. A recent study on the prevalence of eating disorders among 1445 athlete students representing all regions of the United States reported that male students were more likely to use saunas or steam baths to lose weight than female students (Johnson, Powers, & Dick, 1999). One-fourth of the males screened had used this technique to lose weight at some time in their life compared to 7% of females ($P < .0001$), and males were more likely to have used this method in the preceding year ($P = .0006$), (p. 182). However, in spite of the fact that male students use saunas and steam baths four times as often than females, the incidence of DSM-IV diagnosis of bulimia, or having clinically significant problems with bulimia and AN, was less frequent among male athletes than among female athletes (0% vs. 1.1%; 0.01% vs. 9.2%, and 0% vs. 2.85%, respectively).

2.2. Sauna use may be undetected because the expectation of serious sauna incidents reported in AN is unwarranted

As a popular Finnish proverb asserts (Kauppinen, 1997), when used in an appropriate way, anybody who can walk into a sauna can walk out of it. The data on 221 cases of sauna deaths in Finland from 1970–1986, where there were 1,400,000 saunas (Valtakari, 1988), show that neither AN nor other eating disorders were mentioned as contributing causes of death (Kortelainen, 1991). Deaths were mostly related to alcohol (Kortelainen, 1987), and cases studied were mostly male (80.7%), whose mean age was 50 ± 14 (males) and 58 ± 14 years (female). Thus, adverse outcomes of sauna do not seem to occur in young women. They do occur, however, in those far removed from the demographic profile of people with AN.

Likewise, the only study published to our knowledge of sauna use by a group of eating disorder patients involved the screening of a consecutive series of 500 women in the Eating Disorders Clinic at the University of Minnesota (Mitchell et al., 1991). The authors reported the absence of: “any specific adverse events associated with sauna” (p. 419) for those women who satisfied DSM-IV R criteria for bulimia nervosa, and who, along with saunas, used laxatives and experienced frequent vomiting.

In summary, neither the apparent absence of adverse effects nor the absence of reports conclusively imply that sauna use is absent in AN. While at first glance it may seem that sauna use may be avoided by such people, we would like to suggest that there may be surprisingly positive effects of this in treatment. Indeed, it is the *benefits* of sauna in prevention and treatment that may be going unnoticed by both patients and clinicians.

3. The heat-treatment project at Santiago de Compostela University (USC)

Possible evidence about the benefits of sauna for people with AN stems from our 4 years experience at the USC exploring the therapeutic use of gentle heat application in AN. Among the different strategies of heat-treatment, we use an infrared sauna (Infraspa, model T11) which, unlike the conventional Finnish sauna, allows us to work with lower temperatures, and to program the beginning and end temperature values for each session (Gutierrez & Vazquez, 2001). The sauna protocol sets in and out temperatures and begins with short sessions in the T11 cabin with progressive increases in exposure time over the weekly sessions (Gutierrez & Vazquez, 1999). Treatment is provided in an outpatient setting, accompanied by support and encouragement but with no other specific counseling or psychotherapy.

3.1. Hyperactivity, a Cinderella among symptoms of AN

Heat treatment was developed with the specific aim of helping patients to control strenuous exercising and other manifestations of hyperactivity. Excessive activity is a recurrent characteristic observed in people with AN since the first modern descriptions of the illness. Increased physical activity was unexpected and intriguing to Gull (1874) and Lasègue (1873), who emphasized this feature in their first case reports. Throughout the twentieth century authors from diverse therapeutic traditions have highlighted the diverse ways in which AN patients exhibit hyperactivity. From the 1960s on, when studies were aggregating patients in the first attempts to characterize the specificity of anorexia, reports consistently documented increased physical activity (Crisp, Hsu, Harding & Hartshorn, 1980; King, 1963). More recently, several authors (Brewerton, Stollefson, Hibbs, Hodges, & Cochrane, 1995; Davis, Kennedy, Ravelsky, & Dionne, 1994; Touyz, Beumont, & Hook, 1987) have reported evidence of strenuous exercising. A common pattern is that the activity level increases as weight decreases, and it is unusual to find a severely emaciated patient (body mass index of 15 kg/m², or below) who is not overactive (Beumont, Arthur, Russell, & Touyz, 1994).

Hyperactivity is usually understood as a strategy of “burning calories.” People with AN often cannot avoid being active and moving around, sometimes without any purpose (restless hyperactivity). They often indulge in excessive exercising, obsessive-like industriousness (cleaning, overworking, or being engaged in multiple activities), not allowing themselves a minutes rest. Moreover, excessive levels of activity and exercising have been reported even before there is a marked reduction in food intake (Beumont, Booth, Abraham, Griffiths, & Turner, 1983; Bruch, 1966; Kron, Katz, Gorzynski, & Weiner, 1978). To sum up, this known feature of hyperactivity across theoretical frameworks is not reflected in an adequate

appraisal of this feature, and attempts to reconsiderate the meaning and significance of hyperactivity in the whole picture of AN symptoms are still underdeveloped (Casper, 1988; Davis, 1997; Epling & Pierce, 1996; Kron et al., 1978).

3.2. *Research on the animal model of activity-based anorexia*

The main instigation for the development of heat-treatment for hyperactivity was an extrapolation from animal research where the effect of ambient temperature (AT) on the behavior of rats exposed to restricted feeding schedules has been investigated. This research describes decrease in feeding behavior and the “self-starvation” observed in rats when the animals are simultaneously exposed to a restricted feeding schedule and given free access to an activity wheel (Routtenberg & Kuznesof, 1967). Because of the numerous parallels with behavioral features of AN patients (such as hyperactivity, hypothermia, self-starvation, and weight loss), this animal model has been proposed as a potentially useful analogy of AN (Epling & Pierce, 1991, 1996). In this research, it is suggested that hyperactivity in rats (wheel running) serves a compensatory function in support of thermoregulatory homeostasis, impaired by loss of weight brought about by the interaction between restrictive food schedule and physical activity (Sherwin, 1998). However, the pernicious interaction between restricted feeding and activity in the ABA rats is heavily dependent on ambient temperature. Just running the experiment 6 °C above standard temperature is sufficient to inhibit excessive running in the rats. Accordingly, they do not lose weight, do not self-starve, and survive the experiment (Lambert, 1993). What is perhaps more intriguing is that if the experiment is started at standard temperature (20–22 °C), and once rats have lost a 25% of weight and running is over 10 km a day, an increase of AT produces a sharp decrement in the amount of activity. Rats improve their meal efficiency and gain weight in spite of the experimental conditions of restricted feeding and free access to the running wheel (Morrow et al., 1997).

In spite of the obvious differences that exist between this experimental procedure and human AN, this positive feedback loop between restricted eating and excessive activity seems to be present in many AN patients. As such, hyperactivity in AN may be regulated by factors other than merely psychological forces instigating the use of strategies to burn calories. Rather, the indulgence in excessive activity would be seen as a biobehavioral response triggered by physiological consequences of weight loss and resulting hypothermia.

3.3. *Background of heat application in the treatment of AN*

The therapeutic effect of heat was recognized by Gull (1874). He based his recommendation on the observations made by C. Chossat (1796–1875), a Swiss doctor, who performed careful observations on the consequences of starvation in different species. Although Gull only briefly refers to C. Chossat, he was probably influenced by his main work *Recherches experimentales sur l'inanition* (Chossat, 1843), which was awarded the Montyon Prix in experimental physiology by the Academie des Sciences de Paris in 1841. In the fourth section of this work (“Du rechauffement artificiel”) Chossat documents the effect of starvation on

animals and their inability to digest food in the state of inanition, without the aid of external heat. The observations made by Chossat had, in Gull's words, "direct clinical bearings—it being often necessary to supply external heat as well as food to patients" (Gull, 1874, p. 24). Gull recommended that the best means of applying heat "is to place an india-rubber tube, having a diameter of 2 inches and a length of 3 or 4 feet, filled with hot water along the spine of the patient."

Dr. Charles Newington (1781–1852) had devised this appliance for feeding those who were bent on self-destruction by starvation at The Vineyard Asylum in Ticehurst. Ticehurst was one of the most successful and highly reputable private asylums in England, where Gull was a consultant physician (MacKenzie, 1992). Although there were several references to heat treatment in the years following Gull's paper, interest appears to have waned by the turn of the century.

3.4. *The putative physiological mechanism*

As we have reported elsewhere, the effects of heat-treatment are far more wide-ranging than merely reducing hyperactivity (Gutierrez & Vazquez, 2001). As activity receded the patients did not report anxiety, depression, or other unpleasant experiences, but on the contrary they repeatedly stressed the calming and relaxing effect of heat. These psychological changes were followed by a progressive normalization of eating. Furthermore, those changes were maintained during follow-up after the discontinuation of heat application.

Notwithstanding the limited nature of our research on heat-treatment, the extant progress of these patients supports our hypothesis that (a) the use of sauna is more frequent than reported, (b) that it may play a role in the prevention of AN, and (c) it may have therapeutic effects on established AN. The underlying mechanism through which sauna acts on AN may be suggested by previous research and observations. In healthy people, sauna research has documented the physiological effects on the hypothalamic–pituitary–adrenal axis and the sympathetic–adrenomedullary system (De Meirleir, Arentz, Hollmann, & Vanhaelst, 1985; Kauppinen, 1997; Laatikainen, Salminen, Kohvakka, & Pettersson, 1988; Lammintausta, Syvälahti, & Pekkarinen, 1976; Landsberg, Saville, & Young, 1984; Leppäluoto et al., 1986; Vescosi et al., 1992; Vescosi and Coiro, 1993; Ježová, Juránková, Mosnárová, Kriska, & Skultétyová, 1996; Ježová, Větnanský, & Vígás, 1994). Additionally, changes in hormone secretion levels produced by sauna are similar to those produced by exercise, but without the associated energy cost of exercise (Fraïoli et al., 1980; Grossman et al., 1984; Howlett, 1987; Kosunen & Pakarinen, 1976; Kukkonen-Harjula & Kauppinen, 1986; Vescosi et al., 1990). This similarity in hormone secretion may bring about a decrease in the hyperactivity characteristic of many AN patients.

4. Future directions and conclusion

This paper cast doubts on whether the lack of *data* concerning sauna use among people with AN should be taken as evidence that this population does not actually take saunas. As

we have suggested, research is required to determine whether this clinical population does or does not take saunas, and the extent to which heat makes a difference in the course of the disorder. In this respect, Finland stands out as an opportune culture and setting to shed light on three important issues. First, the elucidation of sauna frequency among people with AN, and in what extent sauna makes any difference in the course of the disorder. Retrospective research through follow-up interviews involving former patients could be undertaken to determine the history of sauna use since the development of the disorder. Alternatively, prospective research could be initiated with cohorts of new diagnosed patients monitoring their sauna use. Second, Finland may also provide valuable data for detecting any eventual protection afforded by regular sauna use in high-risk age groups, given the Finnish practice of taking saunas from an early age. It would be interesting to establish for Finnish AN patients the percentage of patients who were regular sauna users before the illness. Third, it may be revealing to know if AN changes former pleasant sauna practice into an unbearable experience and thus regular practice becomes discontinued. Overall, a closer look to sauna use, both previous and during the illness, could reveal too any adverse effects of sauna for these patients.

To develop these ideas further, we are presently involved in several research projects focused on the relation among hyperactivity, hypothermia, and heat dissipation. In collaboration with Dr. Laird Birmingham in Vancouver, Canada, we are investigating different insulation underwear and its effects on hyperactivity measured by electronic pedometers. In a second project in collaboration with Professor Beumont in Sydney, Australia, we are examining the effect of the gentle application of heat on the paradoxical increase in diet-induced thermogenesis observed in AN patients during refeeding (Russell, Baur, Beumont, Byrnes, & Zipfel, 1998). Until these and other studies have been completed, it is still unclear if and how flashes in the sauna affect their hypothermia. Actually, the repeated sauna might act as a priming agent to stimulate blood flow and thus allowing a better distribution of heat from core to peripheral body regions, with the subsequent amelioration of the vasoconstriction and thermoregulatory disturbances, both medical manifestation of the illness (Wakeling & Russell, 1970).

Should heat treatment prove useful, it may have significant theoretical implications and potential benefits to patients. Furthermore, this might lead to cost-saving advantages for the increasingly overstressed public health services. The annual financial burden of AN for a hypothetical European country has recently been estimated to be around £75 million (Bergh & Södersten, 1998). Against this budgetary burden, any development that will facilitate the outpatient management of patients or improving relapse prevention will result in an appreciable saving in the actual cost of AN treatment.

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