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Three major topics are examined in this issue, salvestrols for cancer prevention and therapy, the health benefits of saunas and the rebirth of an old technique for overcoming food allergies, oral immunotherapy, which is now coming of age for peanut allergies.

The first two topics are discussed in the light of case studies. Case studies are in the view of the opinion leaders of evidence-based medicine as the lowest form of evidence. With the advent of the evidence based medicine movement, medical students and physicians have been systematically indoctrinated to view case studies with scepticism and to give the greatest weight to the sacred randomized, double blinded, placebo controlled trials (RCTs). Meta-analyses of such trials represent the ultimate evidence, even though serious limitations of meta-analyses have been recognized for decades. Yet the recognition of successful treatments based on observation of series of cases was traditionally the way medicine advanced. Even today, a large number of treatments and procedures are not backed by RCTs, evolved from the observation of successful treatment, and not only provide great benefit but are necessary, as there are no alternatives. Furthermore, views supported by RCTs continue to topple as new studies appear or old studies are found tainted by bias.

Concerning salvestrols, for now there will only be case studies combined with experimental studies directed at mechanism and biological plausibility. They are natural, unpatentable products sold as dietary supplements with no marketing associated claims allowed concerning cancer. A new set of case studies with long-term follow-up is presented for the information of readers who can then decide if the case histories have any merit. In addition, the experience with salvestrols of an integrative physician practicing in New York which was presented at a recent meeting will be discussed.

The health benefits of saunas have been recognized for centuries and are part of the lifestyle tradition in many countries, mostly European. Thus the evidence of benefit is of interest, even if some of the evidence is not from RCTs. After all, curing diabetic foot and leg ulcers hardly needs full blown RCTs. One undergoes the protocol and the ulcers heal. For diabetics and others with peripheral vascular disease this is a big deal since foot problems involving failure to heal lead to amputations and in fact this is the leading cause of such interventions. It is clear that there are benefits not related to sweating. These will be discussed. Most of the interest in therapeutic applications comes from Japan. For detoxification, sauna appears to be the only approach that impacts both heavy metals and organic environmental food or water-borne toxins.

Raising the threshold for allergic reactions to peanuts using oral immunological treatment with peanut protein has been the subject of a recent RCT. The success achieved should be of interest to anyone involved directly or indirectly with this problem. Oral immunological therapy, which has a history going back over 100 years, can now be make its way toward an accepted and widely practiced approach to improve the quality of life of peanut allergy sufferers, and in the case of children, their parents.

Finally, if you need to restock your supplements, please remember that by ordering through the on-line vitamin store you will be helping to maintain the web site and publication of IHN. You can find the store at <http://www.yourhealthbase.com/vitamins.htm>.

Wishing you and your family good health,

William R. Ware, PhD, Editor

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SALVESTROLS. AN UPDATE

CASE STUDIES WITH LONG FOLLOW-UP

Salvestrols have been discussed periodically in IHN. They were recognized over a decade ago as a unique “magic bullet” for the treatment of presumably any cancer. Evidence supporting the mechanism of action and the biological plausibility has increased dramatically in the past several years with the development of blood based assays of both individual salvestrols, the unique cancer cell-specific enzyme CYP1B1 that utilizes them as substrates to produce specific cytotoxins, and the toxic metabolites themselves. Thus the entire cytotoxic process can be followed from the oral administration of one or more salvestrols to the resultant cell death. The evidence for the cancer cell specificity, the virtually complete absence of the enzyme in normal cells, and the overall mechanism whereby the anti-cancer action occurs in the absence of systemic cytotoxicity is compelling. See the IHN update in the July/August 2012 issue.

What then is the latest on how well salvestrols are working in human studies? Unfortunately there are no results from organized clinical trials. Salvestrols are highly selected and carefully prepared

extracts of several varieties of fruit, a dietary supplement that cannot be patented. Thus the conventional series of Phase I—Phase III studies carried out by Big Pharma to gain regulatory approval can present a financial problem. In this issue we will summarize the current results based on case histories and clinical experience. The latest results derive from a just published book by Dr. Brian Schaefer, *Salvestrols. Journey to Wellness*,¹ and from a presentation by Dr. Michael Schachter, MD, at the annual *Orthomolecular Medicine Today* conference held in Vancouver, B.C. in late April of this year which your editor attended. Dr. Schaefer is employed by the company that makes and sells salvestrols.

First, the results reported by Dr. Schaefer. The book cited contains detailed case reports for 17 individuals successfully treated with salvestrols where there was follow-up to establish time to and in remission, recurrence and mortality. Here are the results obtained from the summary tables in the follow-up chapter. The cancer sites were breast (3), prostate (3), and benign prostatic hyperplasia, bladder, bladder plus pancreas, colon, lung, liver, Hodgkin lymphoma, leukemia, melanoma and peritoneal cancer, one case each. The action of salvestrols on benign prostatic hyperplasia is inconsistent with the conventional view that it is benign but consistent with a study that found CYP1B1 activity in BPH tissue.² But this is just one case and the result should prompt additional research. Age ranged from 36 to 94 years with men and women about equally represented.

- Average time to remission from start of treatment: 6 months (range 1-18). However, 16 reached remission within a year with a prostate cancer case taking 18 months.
- Average time in remission and still in remission. 41 months (8-82), 12 cases.
- Average time in remission followed by recurrence. 45 months (19-60), 5 cases.
- Average time to remission for rapid responders, 2.1 months (1-3), 6 cases.
- Mortality. Two deaths, one from Alzheimer's disease, one of unknown cause.
- All who had recurrences abandoned salvestrols and did not change diet or lifestyle.
- For those still in remission 10 out of 12 are continuing to take maintenance doses of salvestrols.
- In the cases where the attending oncologist estimated life expectancy associated with conventional treatment, most cases reflect a large, unexpected survival.
- Regarding conventional treatment prior to starting salvestrols, 35% had surgery, 37% chemotherapy, 6% radiation and 13% had two different treatments.

The above data represent cases where data was available to the investigators concerning date of diagnosis, pathology, conventional treatment history, salvestrol dose history, time to remission and the presence of recurrence were mostly known. Of course, not all patients have remission for a variety of reasons including low levels of cofactors for the enzyme, dietary, medicinal or supplemental chemicals that inhibit the enzyme action, or inadequate dose or dose escalation for the stage of cancer. The success of salvestrols after conventional therapy is noteworthy. Schaefer's book details each case history in detail in a separate chapter.

Unfortunately, this is the sort of data which devotees to evidence based medicine regard as hardly worth even looking at. After all it could simply be 17 placebo effects, spontaneous remissions or results that no one will be able to replicate. Most reasonable persons would regard these explanations as unlikely, especially given the high level of evidence-based biological plausibility.

Salvestrol doses are not cited in mgs or IU, but in a point system that reflects the measured cell toxicity potency of the extract. Products contain 100, 350, 1000 and 2000 "points" per capsule. For the 17 cases discussed above, average daily doses ranged from 429 to 6000 points. For the four cases of rapid response, average doses per day ranged from 429 to 2000 points. Two other low-dose responders with intake in the same range reached remission in 5 and 18 months.

Of considerable interest is the observation that recurrence occurred only with those that stopped taking maintenance doses of salvestrols. Dr. Schaefer recommends a dose of 2000 points per day both for primary prevention or maintaining remission. In fact, he emphasizes the hypothesis that salvestrols offer a natural defence which was available historically among those who consumed fruits. Modern agriculture and hybridization to eliminate bitterness from fruits and the use of pesticides is viewed as reducing the levels of salvestrols in fruit to the point where amounts ingested even for those who eat lots of fruit do not yield significant generation of cytotoxins. Note that only organically grown fruits provide a satisfactory source of salvestrols. This defence hypothesis is equivalent to saying that cancer can be described partly as a deficiency disease where once cancer cells are formed, a natural mechanism for killing them is impaired. This of course is not the whole answer but suggests that low levels of circulating natural salvestrols tip the scale and the cancer then takes off.

Since salvestrols target an enzyme only present in cancer cells, their use in primary or secondary prevention makes sense. Cancer cells presumably are being generated in everyone on a daily basis due to cosmic radiation, environmental radiation and toxins which damage DNA. Humans obviously have a variety of mechanisms for dealing with these newly formed cancer cells, but they can become impaired. It would be surprising if salvestrols at

adequate levels failed to initiate the mopping up not only new cancer cells, but also cancer cells that break away from a primary tumors and migrate to form metastatic cancer.

RESULTS REPORTED AT THE ORTHOMOLECULAR MEDICINE TODAY MEETING

Dr. Michael Schachter, MD, who is also a board certified nutrition specialist, presented a talk titled *The Role of Salvestrols in the Management of Cancer Patients at the Schachter Center in New York*. Dr Schachter has been involved in nutritional and integrative health care for almost 40 years and is a recognized expert in alternative cancer therapies, EDTA chelation and orthomolecular psychiatry.

The Schachter Center has been using salvestrols for only about 15 months for both primary prevention and treatment. The center now has between 200 and 300 patients on salvestrols with no side effects noted even for very sensitive patients. Dr. Schechter presented two case histories. The first was a 62 year-old woman with B-cell lymphoma who had received chemotherapy but when seen at the center was getting worse with lung involvement and wanted an alternative to more chemotherapy. The patient did well for 5 years on the Center's program which at that time did not involve salvestrols. However the patient then was diagnosed with a brain mass consistent with lymphoma. She returned to the oncologist for chemo which after 5 rounds reduced the mass by 95%. Following the oncologist's recommendation of more chemotherapy which was presented as essential and urgent, she returned to the Center and began salvestrol therapy to prevent progression. She started on 5000 points per day and increased to 16,000 points. After 3 months and 6 months, MRIs were negative and there were no neurological symptoms. At nine months the same results was obtained and at 15 months she is asymptomatic and seems fine.

The second case involved a 75 year-old woman with a large (6 cm) breast cancer tumor. Her oncologist put her on an aromatase inhibitor with plans for a lumpectomy and radiation or a mastectomy after 3 months. At the same time she started salvestrols. At one year still on the inhibitor, the tumor was shrinking slowly, and the oncologist is considering not doing surgery. Currently on 12,000 points of salvestrols.

Dr Schachter also provided information regarding the use of salvestrols for terminal brain cancer in New Zealand. According to the supplier of salvestrols, eight patients were involved and all patients appear to be responding on 16,000 points per day. He also mentioned salvestrol use in China and provided the following quote from one of the physicians, "Salvestrols have enabled the team to bring about reversal of the disease in very late stage cancers where previously the greatest success was with earlier stage cancers."

FINAL COMMENTS

Prodrug is the general term for salvestrols. Prodrugs are inactive and converted by internal biochemistry to active drugs. To make profitable commercial use of the discovery of salvestrols, the standard pharmaceutical industry approach is to synthesize an unnatural version of one of the natural chemicals suggested by the salvestrol research and if it is adequately cytotoxic, patent it and commence the long road to regulatory approval. Note that almost always, approved drugs are single substances, not mixtures. Thus even if this new chemical with profit potential works well, its use it would not only preclude the variety of prodrugs in the current commercial salvestrol dietary supplement, it would probably be very expensive since this is the case with most targeted therapies today. In addition, regulatory approval takes years while cancer patients suffer due to many approved and widely used treatment protocols that do not work very well and in some cases achieved life extension is measured in weeks or months and recurrence and post-treatment metastasis seem quite common.

At least one prodrug modeled after a known salvestrol is now starting clinical trials. Note that this is a decade after the most of the basic information was available and the potential of CYP1B1 based prodrugs recognized. The irony is that almost all the interest in this area

involves inhibiting the enzyme activity because it can convert a few environmental toxins and as well can convert estrogen into carcinogens. It has never been demonstrated that this inhibition has any clinical relevance and the notion of inhibiting an enzyme present in humans that defends against cancer is counter intuitive. The joker in the pack is that if one does not have cancer, the inhibition occurs during one of the processes whereby genes ultimately direct the synthesis of the enzyme, not the enzyme action itself, since the enzyme as a protein is present in negligible amounts in human tissue and only genetic precursors such as messenger RNA are present. It is not even clear inhibitors would impact this carcinogenic mechanism.

Many aspects of how salvestrols work is known, the therapeutic potential established by thoroughly documented cases histories, and assays have been developed for the enzyme, the substrates and the metabolites which allow one to not only diagnose the presence of any cancer, but follow the effectiveness of salvestrol therapy in humans by the disappearance of the salvestrol and the appearance of metabolites, and also measure the cytotoxicity to human cancer cells in cell culture studies. All the ducks are lined up, but few medical scientists or physicians even know about these exciting results and thus few patients have the option of deciding if they want to try salvestrols to deal or even prevent cancer.

Disclaimer: Your editor has no financial interests in the company doing research on salvestrols and marketing them.

HEALTH BENEFITS OF SAUNAS

Saunas have a long history with written descriptions going back at least 1000 years. In fact, saunas appear to have been an important aspect of life in Finland for at least 2000 years. Today there are two million saunas in Finland for five million inhabitants and relaxing in a sauna is an integral part of their culture. They are also popular in a number of European countries. Such widespread use also attests to the inherent safety of the activity.

There are a number of different types of saunas and sauna protocols. The classical Finnish sauna involves a hot room, typically around 80°C which is humidified by throwing water on hot stones. Occupants are warmed mostly by convection and heavy sweating results. Dry saunas either omit the intentional humidification and some use infrared heaters which directly heat the occupants and the room by absorbed infrared radiation in addition to convection. Unresolved controversy exists concerning the relative merits of near vs. far infrared heaters. Nevertheless, the end result is the induction of sweating which provides most but not all of the benefits. Protocols differ. Some call for a cold shower or a plunge into a cold pool following the sauna. Repeating this procedure several times during one sauna session is common, especially in the Finland and countries influenced by their protocol. The Japanese have what they call *Waon Therapy*, which involves a 15 minute dry sauna followed by a period of rest wrapped in blankets, and there are a number of clinical studies that use this protocol. *Waon* is a Japanese word meaning warm soothing.

Commercial infrared sauna kits are widely available from home and building supply outlets and via the internet. The internet also provides instructions for do-it-yourself home saunas, the simplest based on three to four 250W brown infrared heat lamps. Because the body heating process is via infrared radiation, practically any room will do and satisfactory sweating results. The plans on the internet are for a lamp based heater where one alternates exposure with a swivel stool, but it is more convenient to also have heater for the back. A room such as a bathroom is also a good spot since during the winter the humidity can be raised using steam from the shower so that sweat runs off rather than dries on the skin. Care must be taken since the heat lamps become very hot and can break if exposed even to a few drops of water. Also, one should never look directly at the lamps and probably should

consider eye protection. Plans suggest designs that help prevent accidental contact. The effectiveness of this system does not depend on the temperature reached in the room which is essentially irrelevant. Using heat lamps enables one to acquire a home sauna for less than \$100 US.

In the cabinet infrared saunas which are also hot-room saunas and the classical hot-room wet or dry saunas, body heating occurs both by convection through air contact, infrared radiation from the hot walls and infrared radiation from the heater panels installed in the walls. If the room temperature is held constant, then the heaters will probably cycle so that the different body heating mechanisms will also fluctuate. Contrary to what one reads in the infrared sauna web pages, far infrared penetrates only a fraction of a mm, whereas the near infrared which is emitted by heat lamps penetrates several mm. Blood flow in the skin not only controls the skin temperature but also distributes the heat, raising the body temperature by a small amount. The increase in blood circulation has physiological effects associated with the health benefits of the sauna that are independent of the benefits of sweating.

During a sauna, the body core temperature as estimated by an oral thermometer can increase by 1-2°C (2.8-3.6°F) and the heart rate also increases. Monitoring core temperature with an oral thermometer provides protection against overheating and the potential for heat stroke and severe organ damage. In some clinical studies, one sees a limit of about 2°C change in core temperature as an indication for terminating the sauna. Adverse side effects are extremely rare with traditional sauna protocols because the exposure to heat generally lasts only 15-30 minutes per session and it is common practice to drink water to replace that lost by sweat.

There is concern regarding some commercial cabinet infrared saunas where the cabinet is heated to a high temperature. The construction materials may emit toxins which are inhaled or absorbed by the skin and defeat one of the main purposes of the sauna. The use of heat lamps or even portable infrared space heaters in, for example a bathroom, avoids this problem since excellent sweating is achieved while the room temperature only increased by 5-10°C and the sauna may start with a room at ambient temperature.

While historically, general health benefits have always been associated with the use of saunas, the use of sweating to achieve detoxification was popularized by L. Ron Hubbard, the founder of the Church of Scientology, starting in the 1980s and is still referred to by some as the *Hubbard Method*. This protocol involves not only sauna but also exercise and supplements. As discussed in the March, 2014 issue of IHN, recently Professor S. J. Genus and colleagues at the University of Alberta have conducted and published a number of studies which provide evidence for the efficacy of sweating for detoxification where both heavy metals and the principal environmental organic toxins were found to be removed. Thus it is of interest to examine evidence of actual clinical benefit accruing from the use of saunas, not only to induce sweat related detoxification, but also to produce beneficial effects on important biological processes such as thermally induced vasodilatation achieved through the heating effect. A review by Walter Crinnion which examined the impact of sauna on cardiovascular, autoimmune, toxicant-induced and other health problems was published in 2011.³

SAUNAS FOR TREATING HEART FAILURE

In a review published in 2008, Mussivand *et al* from the University of Ottawa Heart Institute summarize the benefits of thermal therapy including sauna on heart failure (HF).⁴ Included were effects on endothelial function, the dynamics of blood flow, heart geometry, neurohormonal markers, and quality of life. In addition, thermal therapy was strongly antiarrhythmic in HF patients. The authors conclude "The clinical evidence highlights repeatable and compelling data showing that thermal therapy may provide an important and viable adjunct in the treatment of heart failure." Several subsequent studies are of interest.

In 2009, Kihara *et al*⁵ published a randomized, controlled study of the 5 year prognosis of patients treated with the Waon therapy (see above). They show a 5-year survival graph (death or re-hospitalization %) vs. follow-up time. At 5 years, the survival rate was 31.3% for the control group, 68.7% for the Waon therapy group. This represents a 37.4% *absolute* rate reduction and a number needed to treat to prevent one event of about 3 over 5 years. It is extremely rare to see such a low NNT in clinical trials. The study involved 129 patients with late stage HF (class III or IV). The controls received conventional medical therapy, whereas the Waon group were treated with a dry infrared sauna in a 60°C (140°F) room for 15 minutes and then kept on bed rest with a blanket for 30 minutes. The protocol called for daily treatments for 2 weeks, and then treatments at least twice a week after discharge. This study followed a randomized trial by the same research group in which Waon therapy was demonstrated to be safe and improved clinical symptoms and cardiac function and decreased cardiac size in patients with HF when the comparison with conventional treatment.⁶ The authors believe that the beneficial effects of Waon therapy derive from improved cardiac and vascular function and reduced ventricular arrhythmias, a view consistent with the above cited study of functional effects and earlier studies which demonstrated Waon therapy induced thermal vasodilatation of the systemic and pulmonary arteries and veins, reduced cardiac preload and afterload and improved hemodynamics.

Another study from Japan using the Waon therapy appeared in 2012. It was found that repeated sauna therapy in patients with HF improves exercise tolerance which was associated with an improved endothelial function as measured by a flow-mediated dilation test, a standard technique.⁷

SAUNAS FOR PERIPHERAL ARTERIAL DISEASE

The prevalence of peripheral arterial disease (PAD) is estimated to be over 10% in individuals age 65 and older. It is a serious complication of diabetes resulting in foot and leg ulcers that may fail to heal with the end result of amputation. Smoking is the most important modifiable risk factors for PAD. Other risk factors include hypertension and systemic inflammation. Early warning signs include odd sensations in the feet. As the disorder advances it becomes painful to walk significant distances. After heart failure, PAD appears to have received more attention than any other disorder in the context of sauna or Waon therapy.

In a 2007 short review, Tei *et al*⁸ list 20 case histories where disorders related to advanced PAD were treated with Waon therapy consisting of 15 minutes in a 60°C infrared cabinet and 30 minutes of rest wrapped in a blanket. Leg or toe ulcers were completely healed in 4 patients and in 3, toe ulcers improved. Walking distance improved in 10 patients and for 3, rest pain resolved. Some had amputations and/or peripheral artery bypass surgery prior to the Waon therapy. Dramatic increases in angiographically visible collateral blood vessel increases (angiogenesis) were seen in 12 legs after Waon therapy. There were no adverse events. Ten of the 20 patients continued treatments after the 10-week period with at least 2 treatments per week.

In a study of 21 consecutive patients treated with Waon therapy, after 6 weeks of therapy leg pain score and ankle-brachial blood pressure index (a measure of peripheral circulation) improved as did the 6-minute walking distance. These changes were not seen in a control group. The study also found that the therapy mobilized circulating endothelial progenitor cells and improved limb blockage in these patients, indicating one potential mechanism for the benefits seen.⁹

A recent experimental study using a mouse model for hind limb PAD found that Waon therapy lead to the development of new blood vessels through a mechanism involving nitric oxide. Waon therapy upregulated a heat shock protein (HSP90) and increased angiogenesis through an enzyme mediated nitric oxide pathway.¹⁰

Thus Waon therapy achieves benefits in PAD by correcting the causative circulation problem with a procedure that is simple compared to artery bypass, and the latter is not a permanent solution. The standard dry or wet sauna protocol using a hot room with or without infrared heating appears to differ from Waon therapy only in the duration of heat exposure and the subsequent slow cooling and resting while wrapped in a blanket. The Waon therapy generally uses a far infrared one-person hot sauna cabinet. Obviously with a home-based infrared sauna, the Waon therapy could be easily implemented although the differences in the details of the sauna protocol might be important. Considering the widespread prevalence of PAD in diabetics and the dismal prognosis offered by mainstream medicine, this option should have great appeal. Unresolved issues include the importance of using far infrared heaters in a hot room compared to, for example, heat lamps in a room only warms up a bit.

ELIMINATION OF ENVIRONMENTAL AND DIETARY TOXINS

The Hubbard detoxification protocol (also called the Hubbard Purification Rundown) includes not only sauna therapy but also a number of other interventions including exercise, electrolyte restoration, multiple vitamin/mineral supplementation containing high doses of niacin, and 1-8 tablespoons of unspecified vegetable oil. The role of the components of the intervention other than sweat induction does not appear to be evidence based in the context of detoxification. There appear to be only four accounts in the toxicology literature describing the use of this protocol for detoxification. Three of these are reviewed by Crinnion.³ Two involved work-related exposure to polychlorinated biphenyls and one involved hydrocarbon solvent exposure. The other study published in 2012 involved detoxification of law enforcement agents exposed to chemicals during raids on illegal laboratories such as those making methamphetamines. The qualifications of the authors of the last study are not clear since they declare affiliations only with non-profit foundations associated with the Church of Scientology. The results of these studies were based on symptom relief and were positive, and were probably due to the sauna treatments, given the results of the following recent more rigorous studies.

Genuis and associates have reported on an interesting and informative investigation termed the *Blood, Urine, and Sweat Study*. They collected blood, urine and sweat samples from 10 healthy individuals and 10 with health problems and measured levels of toxic elements,¹¹ phthalate compounds,¹² bisphenol,¹³ and perfluorinated compounds and polychlorinated biphenyls.¹⁴ These comprise a significant set of studies since the toxins for which they tested are among the most important in the context of current exposure. The results can be generalized as follows. In some cases some toxins were only found in sweat whereas for other individuals, toxins were also seen in blood or urine or both. Sweat analysis compliments blood and urine analysis yielding a more complete picture of the body burden of toxins. Induced sweating was identified as a useful and important intervention for toxin elimination although several toxins were not removed via this route. Nevertheless, these results should encourage the use of saunas for detoxification since there is demonstrated efficacy regarding some of most important toxins.

Sears *et al*¹⁵ have reviewed 24 studies which examined cadmium, lead, mercury and arsenic in sweat. It was found that these metals may be eliminated in appreciable quantities through sweating and the rates found for some metals matched or even exceed urinary excretion over a 24-hour period.

Thus sweating appears to be the only approach to detoxification that addresses the body burden of both heavy metals and common organic toxins, both of which have the potential of inducing serious health problems. Towelling during sweating and showering immediately after a sauna sweating session may help prevent reabsorption of toxins.

HYPERTENSION

The review by Crinnion³ provides two examples where sauna treatment improves hypertension.

- A group of 46 hypertensive individuals experienced a decrease in blood pressure from 166/101 to 143/92 after bi-weekly saunas for 3 months.
- A group of obese hypertensive patients underwent sauna therapy and exercise or as a control, exercise only. The sauna group lost 4.6 times as much body fat and 1.8 times as much weight as the control. Also, the sauna group had a systolic pressure drop of 3.3 times that of the control and a diastolic drop of 1.8 times.

It was suggested that the mechanism for blood pressure reduction involved increased nitric oxide production, a known effect of sauna treatment which is also seen in PAD patients, as discussed above.

OTHER BENEFITS

The following have also been reported, but the evidence is limited.

- Repeated sauna therapy improves myocardial perfusion in patients with chronically occluded coronary arteries.¹⁶ The Waon protocol was used.
- Waon therapy was found to improve exercise tolerance and pulmonary functions in patients with chronic obstructive pulmonary disease (COPD).¹⁷
- Twice weekly infrared sauna treatments were given to patients with either rheumatoid arthritis or ankylosing spondylitis for 4 weeks (30 minutes at hot-room temperature of 55°C). Pain and stiffness decreased significantly in both sets of patients during and after the treatment. Fatigue was also decreased. The treatments were found to be safe.¹⁸

RISKS OF SAUNAS

Prolonged exposure to high air temperatures or infrared heating of the body can potentially result in heat stroke and organ damage. It appears clear that concomitant alcohol aggravates this problem considerably. Studies of the rate of heart attacks in saunas find them to be extremely rare and to be strongly related to alcohol. It is commonly recommended that saunas be avoided if one has aortic stenosis, unstable angina, or severe orthostatic hypotension (large blood pressure drop on standing up) or a history of recent heart attack. If one is facing three or four 250 W heat lamps at a distance of about 2 feet, it appears that 30 minutes is an upper limit. Avoid looking directly at the heat lamps and it may even be wise to use a mask like those handed out on airplanes. When using a new sauna, either commercial or homemade, it may be wise to monitor oral temperature with a limit of a 2°C change. A half-liter of water before a sauna should replace the water lost in sweat.

The risk of saunas during pregnancy is unknown. There is the possibility, unproven, that the hyperthermia associated with taking a sauna increases the incidence of congenital defects, but studies have only involved illness-associated high fevers. Also, there is the issue that many women take saunas prior to being aware that they are pregnant. This appears to be a totally unexplored question. Finnish women use saunas while pregnant, but the exposure is generally short—typically 15 minutes and then perhaps repeated after cooling.

Sauna may influence spermatogenesis. A recent study examined the impact of two sessions per week at 80-90°C, each lasting 15 minutes, on sperm concentration, count, motility, morphology and viability. A significant reduction in all but the last two factors was observed. All the effects were reversed within six months from the end of the saunas sessions. The changes were not great enough in the subjects who had normal fertility to induce significant infertility.¹⁹

NEW HOPE FOR PEANUT ALLERGY SUFFERERS

Peanut allergies significantly impact the quality of life of those with this disorder and their families. The rate of accidental reactions is about 10% and 2% of these require epinephrine or emergency department visits. Some find the allergy psychosocially debilitating. Furthermore these quality of life issues continue into adulthood.

There has recently been considerable interest in using oral immunotherapy (OIT) to vastly increase the tolerance of those with this allergy. A review of six case series studies published in 2012 concluded that OIT was potentially promising.²⁰ The hypothesis is that by slowly increasing the dose of peanut protein it is possible to raise the threshold for the allergic reaction. If this threshold is high enough, it virtually eliminates the possibility of an adverse response to accidental intake. A study just reported²¹ appears to be only the second randomized trial and was much larger than the first which was published in 2010. In this study 49 participants age 7-16 years drawn from the UK were assigned at random to the initial OIT treatment group with 50 acting as a control. When this part of the study ended, the control group was then given OIT. The initial dose was 2 mg of peanut protein followed by 8 escalations over 16 weeks to 800 mg. For the remaining 20 weeks, the 800 mg dose was maintained. The same protocol was used when the control group started treatment. At the end of the intervention, 84% and 91% of the first and second group treated could tolerate the equivalent of 5 peanuts, and there was a high rate of desensitization, i.e. the ability to tolerate the equivalent of 10 peanuts. The typical accidental dose triggering a serious reaction is one peanut. Aside from one individual who had to drop out because of severe reactions, the allergy reactions during the escalation of dose were easily controlled by inhalers. Other side effects included stomach and bowel disturbances were not regarded as serious.

While the conservative opinion appears to be that OIT should still be restricted to clinical studies, Mansfield reported in 2013 that unpublished data from three private allergy practices (presumably in the US) indicates successful OIT was provided to 150 patients including those with a history of peanut anaphylaxes.²² Those completing the OIT (111 patients) could tolerate 4 g of peanut flour or eight peanuts or more. He compares this to the usual accidental dose of about one peanut. No matter whether in a private practice setting or a clinical trial, vigilance and preparedness (including epinephrine—generally the pen) for a serious allergy event is essential.

The major unanswered question appears to be the long-term durability of the greatly enhanced threshold for a serious peanut allergy event. One study has addressed the short term durability (1 month after the end of OIT, and found it present.²³ If continued peanut intake is indicated, then how much is necessary to maintain the desired elevated threshold? No doubt this will be addressed shortly. In the meantime, given that those who achieved desensitization can consume a limited amount of peanut protein without danger, the maintenance dose used in studies would appear to be a simple starting point.

Readers interested in this matter should download the 2014 paper which is open access.²¹ Google *Andrew Clark peanut allergy* and look for the title of the paper “*Assessing the efficacy of oral immunotherapy*” Even though the paper was published in *The Lancet* there are probably allergists who have not seen it. Furthermore, some medical professionals do not like suggestions as to how they should practice medicine. Giving them a reprint, even from *The Lancet*, may create an uncomfortable situation. Yet OIT has been around for a long time, even in textbooks. **OIT is not something to try at home without detailed instructions and back-up from a physician.**

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