

Results

Mineral analysis pre-treatment indicated that 7 of the 9 patients enrolled had low cellular magnesium levels as predicted by our epidemiological analysis. After transdermal applications for 12 weeks all patients except one had a significant increase in cellular magnesium ranging from 2% to 262%. One patient prematurely ceased application 3 weeks prior to final testing. Overall an average increase of 59.7% was seen. See Table 2.

	Patient 1	Patient 2	Patient 3	Patient 4	Patient 5	Patient 6	Patient 7*	Patient 8	Patient 9
National expected average	4-7	4-7	4-7	4-7	4-7	4-7	4-7	4-7	4-7
Prior to trial	3.1	3.0	3.2	12.0	4.0	2.9	9.8	4.8	5.8
Post trial	3.7	4.1	5.8	18.1	4.1	5.5	9.1	4.9	15.2
% change	+19.4%	+36.7%	+81.3%	+50.8%	+2.5%	+89.7%	-7.1%	+2%	+262%
Results	Number of subjects who experienced an increase in cellular magnesium: 89% Mean increase in cellular magnesium levels over trial period: +59.7%								

Table 2: Cellular magnesium levels pre and post trial phase

***Patient prematurely ceased application 3 weeks prior to final testing.**

The data set was then used to calculate the effect on the calcium/magnesium ratio. Based upon the ratio of calcium to magnesium within the body recommendations by nutritional practitioners can vary from a 4:1 - 1:1 (Ca/Mg) ratio. It is understood that calcium and magnesium oppose each other at the intracellular level and that calcium requires the presence of sufficient magnesium for it to become soluble within the body. Thus low magnesium intake will produce evidence of high calcium storage outside of the bone (referred to as calcification). Taking modern nutritional trends into consideration in a ratio 7:1 in favour of calcium was used as a reference level. It is important to note that the average ratio prior to trial was found to be 3 times this level.

These results are presented in Table 3.

Overall 100% of patients improved their calcium/magnesium ratio and the average improvement over the period of this study was 25.2%.

	Patient 1	Patient 2	Patient 3	Patient 4	Patient 5	Patient 6	Patient 7	Patient 8	Patient 9
National expected average	7:1	7:1	7:1	7:1	7:1	7:1	7:1	7:1	7:1
Prior to trial (Ca:1Mg)	12.3	15.3	21.9	12.1	46.8	23.5	20.0	23.5	20.2
Post trial (Ca:1Mg)	10.8	12.2	13.3	7.8	33.9	20.6	14.1	19.8	5.0
% change	-12.2%	-20.3%	-39.3%	-35.5%	-27.6%	-12.3%	-29.5%	-16%	-75%
Results Number of subjects who experienced an improvement in the calcium/magnesium balance: 100% Mean improvement in calcium/magnesium ratio over trial period: 25.2%									

Table 3: Effect on calcium/magnesium ratio.

***Measurement indicates units of calcium compared to 1 unit of magnesium**

Finally, and the most surprising finding was the effect of the magnesium on the detoxification of toxic minerals. Seven of the nine test cases, so 78%, showed that using the magnesium oil body spray alongside the foot soak was able to antagonise and release toxic minerals including aluminium, lead, cadmium and mercury amongst others. These observations are recorded in Table 4.

There are two basic relationships that exist between nutrients. In some instances they work together, or in co-operation with each other so have a synergistic relationship. At other times nutrients can work against each other in an antagonistic relationship. Antagonism of nutrients can occur at the intestinal or cellular level and the antagonistic effects of magnesium may be used by health professionals to assist detoxification at a cellular level. This research was conducted over twelve weeks and so levels during this period are likely to rise. As the toxic minerals are antagonised and so released from storage sites within the body, the level of a circulating toxic mineral may rise on a HMA prior to expulsion.

Magnesium is a well recorded antagonist for these toxic minerals but generally health practitioners will use extensive detoxification protocols with their patients/clients and yet this study showed that using a

simple application of 20 daily body sprays and a twice weekly foot soak brought about some significant changes in the toxic mineral picture with minerals clearly being released from storage and excreted.

Toxic mineral	Shading indicates evidence of toxic mineral release Measured in Hair Analysis								
	Pt 1	Pt 2	Pt 3	Pt 4	Pt 5	Pt 6	Pt 7	Pt 8	Pt 9
Uranium		■				■		■	
Arsenic	■		■						
Mercury	■								
Cadmium	■				■				
Lead	■	■						■	
Aluminium	■	■				■			■
Participants who showed significant evidence of detoxification: 78%									

Table 4: Effect on toxic mineral expulsion - Magnesium aids the cell’s ability to expel toxic minerals.

Discussion

This pilot study represents a major step forward in both our understanding of the superior absorption qualities of the Zechstein magnesium source but also in provided evidence of the dramatic impact the mineral has on the body. Despite the relatively small sample size the results are significant. Data shows that around 74% of the population in general are likely to have sub optimal levels of magnesium and that this imbalance is unlikely to be improved by Government intervention in Agricultural practices. It is clear that the concentrated chloride form of the Zechstein seabed mineral solution (Better You™ Magnesium Oil) can significantly improve cellular magnesium in 59.7% of these patients. The therapeutic value of magnesium chloride as a transdermal application reaches well beyond the potential of dietary magnesium as it effectively saturates the tissues, delivering high concentrations magnesium to where it is needed most i.e. at the cellular level, directly into the circulation, entering the tissue cells immediately.

This study confirms that transdermal application of magnesium in the chloride form will raise magnesium levels within the body over a relatively short period of time. Additionally, the relationship between calcium and magnesium is important for many health aspects (for example bone building) and raising magnesium levels has a beneficial effect on the body ratio between calcium and magnesium. Again this study clearly demonstrated a beneficial effect in preventing calcium build up in

Magnesium supplement helps boost brainpower



Neuroscientists at MIT and Tsinghua University in Beijing show that increasing brain magnesium with a new compound enhanced learning abilities, working memory, and short- and long-term memory in rats. The dietary supplement also boosted older rats' ability to perform a variety of learning tests.

Magnesium, an essential element, is found in dark, leafy vegetables such as spinach and in some fruits. Those who get less than 400 milligrams daily are at risk for allergies, asthma and heart disease, among other conditions. In 2004, Guosong Liu and colleagues at MIT discovered that magnesium might have a positive influence on learning and memory. They followed up by developing a new magnesium compound — magnesium-L-threonate (MgT) — that is more effective than conventional oral supplements at boosting magnesium in the brain, and tested it on rats.

"We found that elevation of brain magnesium led to significant enhancement of spatial and associative memory in both young and aged rats," said Liu, now director of the Center for Learning and Memory at Tsinghua University. "If MgT is shown to be safe and effective in humans, these results may have a significant impact on public health." Liu is cofounder of Mageutics, a California-based company developing drugs for prevention and treatment of age-dependent memory decline and Alzheimer's disease.

"Half the population of the industrialized countries has a magnesium deficit, which increases with aging. If normal or even higher levels of magnesium can be maintained, we may be able to significantly slow age-related loss of cognitive function and perhaps prevent or treat diseases that affect cognitive function," Liu said.

To understand the molecular mechanisms underlying this MgT-induced memory enhancement, the researchers studied the changes induced in functional and structural properties of synapses. They found that in young and aged rats, MgT increased plasticity among synapses, the connections among neurons, and boosted the density of synapses in the hippocampus, a critical brain region for learning and memory.

Susumu Tonegawa at MIT's Picower Institute for Learning and Memory helped carry out the initial behavioral experiments that showed that magnesium boosted memory in aged rats. Min Zhou's laboratory at the University of Toronto helped demonstrate the enhancement of synaptic plasticity in magnesium-treated rats.

This study not only highlights the importance of a diet with sufficient daily magnesium, but also suggests

the usefulness of magnesium-based treatments for aging-associated memory decline, Tonegawa said. Clinical studies in Beijing are now investigating the relationship between body magnesium status and cognitive functions in older humans and Alzheimer's patients.

More information: "Enhancement of Learning and Memory by Elevating Brain Magnesium," Inna Slutsky, Nashat Abumaria, Long-Jun Wu, Chao Huang, Ling Zhang, Bo Li, Xiang Zhao, Arvind Govindarajan, Ming-Gao Zhao, Min Zhuo, Susumu Tonegawa and Guosong Liu in *Neuron*, published Jan. 28, 2010.

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White gold shimmers in Veendam

Will magnesium chloride become Veendam's white gold? Richard Danel, a Groningen-based physician and Dave Janse, a mineralogist and chemical engineer from Veendam are investigating this. They have set up a knowledge centre in Veendam. Together with the scientists of the University of Groningen, the University Medical Centre Groningen and the Munich's Ludwig Maximilian University, they are researching the benefits of magnesium chloride.

By Marscha van Noesel

It is well known that people with skin diseases like psoriasis obtain relief from Dead Sea salt or magnesium chloride. Physician Richard Danel and mineralogist and chemical engineer Dave Janse now aim to demonstrate scientifically that magnesium dissolved in bath water is therapeutic for many more ailments and diseases. It might even be possible to create a therapeutic lake using the purest magnesium chloride that can be mined only in Veendam; and this lake could then compete with the Dead Sea. The Dutch Foundation of Skeptics (*Stichting Skepsis*) and allopathic physicians are currently maintaining their distance for the time being.

For more than 30 years, Veendam-based NedMag has been extracting industrial-grade magnesium at a depth of 1600 metres beneath the earth's surface in the village of Tripscompagnie. Scientific research in the United States recently confirmed to Messrs Danel and Janse that a magnesium deficiency in the body can contribute to ailments and diseases. And according to Richard Danel, people in the West have a chronic magnesium deficiency. This deficiency may be remedied by applying magnesium chloride to the skin in oil form or by dissolving pure magnesium chloride in bath water. Messrs Danel and Janse claim that Veendam's 'white gold' may be of great significance for human health and well-being in the future. Once this has been generally accepted, Dave Janse is even considering the creation of a therapeutic lake containing magnesium chloride in the east of the Province of Groningen, comparable to the Dead Sea in Israel.

Richard Danel and Dave Janse are convinced of the beneficial effects of magnesium oil or magnesium chloride added to bath water. While there is no scientific foundation for these effects, they are cautious with their words. That is why the gentlemen have set up the Magnesium Health Institute in Veendam. Richard Danel explains: "Our aim is to facilitate research through this Institute. As a physician, I can't just take anything for granted, even if I'm convinced we're right. We're now working hard and co-operating on thorough, well-founded research with the University of Groningen, the University Medical Centre Groningen and the Ludwig Maximilian University in Munich."

Why might people have a magnesium deficiency? Aren't there enough minerals and vitamins in our diet? According to Dave Janse, Dutch farmland is so poor that today's agricultural products do not contain nearly enough magnesium. "The soil is exhausted, as it were. And magnesium is ignored in fertiliser production. Many decades will pass before the soil reabsorbs this mineral if we start adding it today," Dave Janse says.

Conversely, the Netherlands Nutrition Centre (*Voedingscentrum Nederland*) considers it entirely unnecessary to take extra magnesium chloride. The Centre's spokesman Roy van der Ploeg comments: "There are no indications whatsoever in our most recent research, the National food consumption survey 2003 (*Voedselconsumptiepeiling 2003*), that large groups of the Dutch population are suffering from a magnesium deficiency."

So what products contain magnesium? The Netherlands Nutrition Centre says there is sufficient magnesium in cereals, green vegetables, milk, dairy products and meat. Roy van der Ploeg continues: "A magnesium deficiency does not manifest itself readily, but when such a condition does occur, people can feel tired and listless, or suffer from muscle cramps and even cardiac arrhythmia in extreme cases. But it's difficult to determine whether these symptoms are the result of a magnesium deficiency. People can develop diarrhoea if they take too much magnesium, for example in tablet form."

Richard Danel has figures from American research from which he concludes that people in the West clearly do have a deficiency of this mineral. "Doctors request blood tests for their patients to determine a magnesium deficiency, but this almost always turns out to be at the correct level. Blood tests determine the contents of the blood and not what is found between the body cells. A device is now available that can indicate the concentration of magnesium in the blood but also the intracellular magnesium content. However, investigation into the significance of magnesium chloride is still clearly in its infancy here," Richard Danel says.

Jan Willem Nienhuys, Secretary of The Dutch Foundation of Skeptics (*Stichting Skepsis*) claims the substances contained in blood are found throughout the body: "If an individual's blood is found to contain 0.1 per cent alcohol, that percentage holds for the rest of his body, and this is particularly true of the brain, which consequently does not function quite so well."

Private clinic "Kop van Zuid" in Emmen offers magnesium baths to patients after treatment by a chiropractor. Health centre Fontana in Nieuweschans also offers magnesium-chloride therapy, as it has been known for some time that this can bring significant relief to psoriasis patients.

Allopathic medicine acknowledges that magnesium chloride has a strong laxative effect. It is sometimes prescribed for people suffering from constipation. The Dead Sea salt available from many health food shops and recently also available from discount supermarket Aldi also has a laxative effect, albeit less efficacious than magnesium chloride. A saleswoman in a health food shop claims that she frequently uses Dead Sea salt in her bath water to help detox her body.

So if Dead Sea salt or magnesium chloride have absolutely no dermal effect in their dissolved form, why do health insurance companies fund Dead Sea therapy? If the salt does not enter the body via the skin, why is there a laxative effect after a magnesium bath? These are non-issues as far as Richard Danel and Dave Janse are concerned. The two gentlemen regularly welcome scientists from every corner of the globe. Richard Danel lectures throughout the country and beyond to tell people about the world's purest source of natural magnesium chloride, which comes from Veendam.

Nowhere other than in Veendam is the product treated in a laboratory especially for its therapeutic effect and subsequently packaged to prevent it from further contamination, Dave Janse says. "Dead Sea salt contains many other materials. And it's also been exposed to the open air. All kinds of air pollution, including that of airplanes for example, precipitate into the Dead Sea. Our magnesium chloride is extracted from deep beneath the earth's surface and is subsequently treated so meticulously and checked for quality in the laboratory that we can safely guarantee that it is the purest possible naturally occurring magnesium chloride."

Richard Danel has a particular dislike of quackery. He is even a supporter of the Dutch Foundation of Skeptics (*Stichting Skepsis*). He is aware that much time may pass before people knowledge that he and Dave Janse are right. "How long did it take before there was any official recognition that iodine is good for the body. Or how long ago was it that people suffering from gastric ulcers had to undergo surgery? They are now prescribed a course of tablets and their symptoms disappear. Magnesium sulphate injections are now routinely administered in hospital to people who have suffered a heart attack, but magnesium chloride is likely to be equally effective if not better. We also know that women suffering from pre-eclampsia, who are administered magnesium chloride, bring healthier babies into the world than those who did not receive the product. Our goal is to provide proof of this. I intend to do my utmost to have magnesium chloride from Veendam formally registered as a medicine. We cannot achieve anything in the world of medicine otherwise."

Jan Willem Nienhuys of the Dutch Foundation of Skeptics (*Stichting Skepsis*) remains sceptical. "People may develop magnesium deficiency if they take too much diuretic medication, which in turn indicates that the kidneys simply remove any excess." According to Mr Nienhuys, it is impossible to increase the level of magnesium in the body by briefly sitting in a bath containing some magnesium chloride. "If you take a bath for a while you get wrinkled hands because the skin absorbs water. The thing here is that the skin only absorbs the water and not the salts dissolved in it. And that's a good thing, as somebody swimming in the sea for any length of time is otherwise at risk of absorbing far too much salt and suffering rapid death."

Richard Danel is eager to engage sceptics like Mr Nienhuys in discussion. He advises The Dutch Foundation of Skeptics (*Stichting Skepsis*) and the Netherlands Nutrition Centre (*Voedingscentrum Nederland*) to study the most recent findings of the FDA (American Food & Drug Administration), from which it emerges that a human needs 400 to 600 mg each day, while the average intake via food is currently 200 to 300 mg. "I'm disappointed by the reaction of the Foundation of Skeptics. Let's look at the effect of wrinkled skin, for example. If the skin does not absorb magnesium chloride, how can we believe that hormone patches or nicotine patches are effective? The body also absorbs the materials administered in this way via the skin, doesn't it? And these are even covered by the healthcare insurers. So is this entirely unjustified? I hope that scientists out there are willing to study mainly foreign scientific literature on our magnesium chloride, if only to dispel their scepticism in this regard."

Caption: Dave Janse (left) and Richard Danel at NedMag.
Photos: Dennis F. Beek

Magnesium Appears to Boost Lung Function in Asthmatics

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A new study from the United States shows that daily supplementation with magnesium may improve lung function in asthmatics and improve their quality of life.

Measures of lung capacity increased by about six percent during six months of magnesium supplementation, and improvements were also observed in the bronchial response to methacholine, a chemical that produces constriction in the lungs, according to findings published in the *Journal of Asthma*.

"Although there is conflicting research regarding magnesium supplementation and asthma outcomes, this study adds to the body of research that shows a beneficial response to magnesium supplementation in people who have mild to moderate asthma," wrote researchers, led by Alexandra Kazaks from Bastyr University in Kenmore, Washington.

Epidemiological studies have reported beneficial effects of magnesium on asthma occurrence and management, but less than half of adults in the U.S. consume the recommended levels of the mineral, according to the National Health and Nutrition Examination Survey (NHANES) for 1999-2000.

In order to test the hypothesis that magnesium supplements could improve lung function, Dr. Kazaks and her co-workers recruited 55 mild-to-moderate asthmatics aged between 21 and 55 to participate in their randomized placebo-controlled, double-blind trial. The participants were randomly assigned to receive either a daily dose of 340 mg of magnesium or placebo for 6.5 months.

At the end of the study, a six percent improvement in lung function, measured as the peak expiratory flow rate (PEFR), was observed in the magnesium group and not in the placebo group.

Furthermore, 20% more methacholine was needed in the magnesium group to produce bronchoconstriction to the same degree as seen in the placebo group.

Quality of life, a subjective measure obtained by questionnaire, only improved in the magnesium group, added the researchers.

Commenting on the potential mechanism, Dr. Kazaks and her co-workers noted that magnesium may influence the properties of cell membranes, thereby improving the ability of the lungs to expand. The mineral may also offer anti-inflammatory properties, which could improve asthma control, they said.

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