

COLD SORE CURE GIVES RAY OF LIGHT FOR ALZHEIMER'S

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Two doctors developing a light treatment to cure cold sores claim they have discovered clinical benefits when using the infrared technology on patients with Alzheimer's disease. The Clinical Services Journal reports.

Evidence is building that the cold sore virus may be linked to Alzheimer's disease according to scientists at Manchester University. After infecting cultures of human brain cells with the herpes simplex virus (HSV-1), researchers found there was a rise in beta amyloid protein, associated with the development of Alzheimer's, while a similar increase was seen in the brains of mice infected with the virus.

In a separate experiment, the Manchester team stained brain slices taken from deceased Alzheimer's patients and found DNA from the HSV-1 virus attached to the amyloid plaques. Previous research has already established that the virus is found in the brains of up to 70% of people with Alzheimer's.

Now two doctors believe they may have discovered a treatment for cold sores, which could also prove beneficial in the treatment of patients with Alzheimer's – using infrared light technology. In 1996, Gordon Dougal and James Haslam set out to research the infrared spectrum to explore the theory that there is a wavelength or narrow waveband of light that is responsible for therapeutic effects.

When the pair first initiated their research, infrared light was already recognised clinically as a treatment of musculo-skeletal disorders and indolent wounds but the evidence for its efficacy and the method of action was entirely anecdotal. Previous research employing random wavelengths of infrared light determined by the availability of predominantly laser light sources had explored various in-vitro laboratory effects. Although these works had not been correlated with clinical studies there was sufficient evidence to suggest that several immunological reactions could be influenced by infrared light.

HERPES VIRUS

For their studies, Gordon Dougal and James Haslam chose to investigate herpes labialis infection – i.e. cold sores caused by the herpes simplex 1 virus. "We chose this area because cold sores are a convenient way to examine the host response to a superficial, frequently recurrent viral infection. Affecting up to 80% of the population at some time in their life, they are relatively easy to document photographically and by patient feedback," James Haslam explained. Gordon Dougal and James Haslam treated more than 400 volunteers over a three year period using different narrow wavebands of light determined by the commercial availability of Light Emitting Diodes (LEDs).

The results from these studies allowed them to predict that an effective waveband was likely to be in the vicinity of 1050 nm. Unfortunately, there were no LED light sources available in this vicinity so they approached Durham University for their help. They asked the university to identify a chromophore, an absorbing pigment, in human skin within the vicinity of 1050 nm. The help was forthcoming but the answer to the question was a disappointing "no".

Undeterred and in collaboration with the university, they looked at the light transmission spectrum of the water molecule. "Light at 1072 nm is selectively transmitted through water and is very close

to our predicted therapeutic waveband," James Haslam explained.

The next cold sore trial investigated this wavelength. A pilot study of treatment of herpes labialis with 1072 nm narrow waveband light was published in the journal of Clinical and Experimental Dermatology in 2001. This trial showed that a five minute treatment with a nonthermal quantity of 1072 nm light reduced cold sore healing time by half compared to aciclovir ointment applied five times daily.

IMPROVED CEREBRAL ACTIVITY

"It was becoming obvious to us that this wavelength of light was capable of various therapeutic effects, the most unusual of which was to enhance cerebral activity. Gordon observed that after irradiating his brain (5% of the light is transmitted through the skull) his mental agility was improved," he commented.

With ethics committee approval, they commenced treatment of patients with dementia and although they recruited only a small cohort, they were able to observe an improved standard mini-mental score after six weeks of treatment lasting 20 minutes every second or third day. At the same time the volunteer's carers observed an improvement with patients becoming more spontaneously sociable as treatment progressed.

"Whilst random trials using 1072 nm light were interesting it became obvious that in order for this new technology to be taken seriously it would be necessary for us to find a laboratory model which might confirm the photo-biological nature of 1072 nm light.

"Our endeavours were helped by Dr Chazot in the department of photobiology at Sunderland University where we undertook to sponsor postgraduate research. We were particularly keen to study the immune response to herpes simplex infection given the knowledge that this light has no direct effect on the virus and that cold healing is enhanced by 1072 nm light treatment," James Haslam continued.

Probing the differential effects of infrared light sources IR1072 and IR880 on human lymphocytes, evidence of selective cytoprotection by IR1072 nm was published in the journal of Photochemistry and Photobiology (2005). This paper suggested that a non-thermal quantity of light afforded some protection to lymphocytes against a subsequent toxic threat, either chemical or UV, and perhaps more importantly measured a chemical change within the cell as a result of irradiation.

However, the two doctors set their sights further: "We knew from our unpublished work that there was potential for treating a variety of other conditions and felt that there was an opportunity to investigate more thoroughly the potential of this light beyond the humble cold sore," said James Haslam.

ANTI-AGEING

"With the knowledge that 1072 nm light had been proven to be antagonistic to UV and had been demonstrated to increase cell longevity we wondered about the possibility of its application to photoageing of skin. Initially we treated ourselves with our laser diodes and were able to observe, after a period of six weeks or so, an improvement in the complexion of the skin with reduced fine lines and wrinkles. Subsequently Gordon designed a 1072 nm LED array which was put to the test in an ethics committee approved double blind clinical trial.

"The results of the self reported clinical trial showed that 70% of volunteers who received an active device were able to accurately identify a qualitative improvement in fine lines and wrinkles of the treated skin around the eyes," he continued.

For the university research, the two doctors returned to the potential for 1072 nm light to treat dementia – this time using an animal model. The emotional responses and memory performance of mice in a 3-D maze, after infrared light treatment, were recorded and published in the Journal of Neuroscience (December 2007). Adult mice with significant deficits in a working memory test had these deficits reversed by the application of IR1072 for six minutes daily for 10 days. "Recent work at Manchester University has postulated a connection between Alzheimer's disease and cold sores. It is probably a coincidence that we have a treatment for both. However, we are hopeful that our

discovery of IR1072 as a therapeutic technology will also open up new horizons for treating a variety of conditions," said James Haslam. Both Gordon Dougal and James Haslam acknowledge there is still a lot of research to be done but their findings, so far, offer scope for further investigation and the duo hope to commercialise a therapeutic technology for dementia in the future. They also see the potential for other applications, but add that this may be for others to pursue, in recognition of the limitations of their current resources and clinical expertise.

James Haslam concluded: "The possibility of enhancing local or systemic immunity is truly exciting and the possibility of treating infections such as viral meningitis or encephalitis cannot be ignored. We have a wealth of anecdotal evidence that this light is effective in the treatment of acne, rosacea, dry eyes, and shingles but for the time being we are having to concentrate on survival in a world where commercial viability is of paramount importance."

Gordon Dougal and James Haslam

Dr Gordon Dougal and James Haslam FRCS, FRCOph, founded a company Virulite, in 1996, as a research vehicle to investigate the therapeutic potential of the near-infrared spectrum. Dr Dougal qualified in South Africa and also has an additional degree in electronic engineering. He is currently working in general practice in Peterlee. Mr Haslam qualified in Edinburgh and is currently working as a consultant ophthalmologist in Darlington.

Virulite is now recognised as a medical device manufacturer and distributor to ISO 13485 quality standards. Following the award of this certificate, they were able to pursue an application to the Prescription Pricing Division of the NHS for the Virulite cold sore machine to be available on Part IX of The Drug Tariff. This application was successful. From January 2008 the treatment will be available on prescription. Dr Dougal has now designed a dementia treatment helmet based on the technology.

For more information, visit: <http://www.vcs.eu.com/>
