United Kingdom Water Treatment Association

Eczema and Softened Water

The disease - Atopic eczema has doubled in the last 20 years and currently affects around 15% of children in the UK. It causes itching, soreness, secondary infection, sleep loss, distress for all the family and is a burden to the health service. Current medical treatment uses moisturisers and also topical steroids, which on rare occasions can have skin-thinning side effects, so alternative treatment is frequently requested.

Reported effects of softened water

Many new owners of domestic water softeners have reported a significant and often rapid improvement to the condition of eczema sufferers in their homes. Some GPs and dermatological consultants have also reported a substantial improvement to patients who have moved into areas of the country where the water supply is soft. This was borne out by the results of mapping studies that have shown a lower incidence of childhood eczema in areas supplied with naturally soft water.

A recent water-softener intervention trial was carried out in the UK and did not show a benefit (www.swet-trial.co.uk). However, UKWTA members continue to receive consumer reports of improvement to eczema conditions when softeners were installed in their premises and a formal database of these reports is being prepared.

The historical evidence **-** Anecdotal evidence from many doctors and patients reports an improvement in eczema symptoms when patients moved from hard to soft water areas. This is sometimes over a few days and is sometimes linked to holidaying in soft-water areas such as Wales or the South West, where the condition will recur on their return. Many softener users report improvement in the symptoms after installing the softener.

Ecological epidemiological studies have found a relationship between the prevalence of eczema and hardness of the water supply. A 1998 study by Nottingham University (McNally et al) compared the incidence of childhood eczema with the various levels of water hardness in the Nottingham area. This showed a statistically significant lower occurrence of eczema for primary school children in soft water areas (12%) compared to hard (17%). Other studies in Japan (Yoshihiro Miyake et al) in 2002 and Spain (Ardeno-Pena et al) in 2006 showed similar results.

The explanation for lower rates of eczema in soft water areas has been hypothetically linked to the need, in hard water areas, to use more soap and detergent to achieve lather. A direct effect on the skin of the soap scum produced by hard water, or to the detergent scum residue in laundry (clothes and bedding) aggravating sensitive skin is also possible.

The Intervention Trial **–** The historical evidence prompted a UK government-funded intervention trial, starting April 2007 and completed in January 2010, involving 336 patients suffering moderate to severe eczema.

The trial was organised by the Centre of Evidence Based Dermatology, University of Nottingham, who provided the nursing staff, medical equipment, collation of data and preparation of the report. Generic, unbranded, base-exchange softeners were provided by the industry for the trial.

Half the patients were provided with a softener and the severity of their eczema was measured by a research nurse at the beginning and end of the 12-week installation period and compared with the "parallel group", without a softener.

The investigation team was surprised to see that both groups (with and without the softener) improved by the same amount (20%). So the conclusion was that there was no clear benefit from the softener on the severity of eczema in the children who took part.

Secondary outcomes from the trial, such as the patient assessment of their change in eczema and the effect on family life, showed a statistically significant, but small, benefit to the softener group. A follow-up questionnaire sent to the participants at the end of the trial showed over half believed that there was some improvement to the eczema from the softener during the trial.

At the end of each participant's trial period, they were given the option to purchase the softener. The 66% uptake was surprisingly high; particularly taking into account the socio-economic spread of the trial population. Unsolicited comments from trial participants on purchase ranged from "our child's eczema is completely cured – it has transformed our lives" to "it has not affected our child's eczema but we love the other benefits of softened water".

Ongoing investigation – **To help clarify the situation further, the UKWTA is developing a large database to formally quantify customer feedback on the benefit of softened water to eczema. The research, which will be based on responses to independent customer satisfaction surveys carried out on purchasers of softeners from the UKWTA membership, will also cover other benefits of water softeners such as heating system maintenance and soap/detergent costs.**