THE KNOWLEDGE BRIDGE BETWEEN GPs AND SPECIALISTS

medical Grapevine

APRIL 2015

Early Stage Bladder Cancer
Can it be cured?

Kidney Transplantation
What should we know?

Breast Imaging
Recent updates

Eczema
Tackling an old problem with new ideas

Pre-eclampsia
The scourge of pregnancy

Striving for Excellence

Dr Benjamin Chua on the fast-changing field of endovascular surgery

Eczema

Tackling an old problem with new ideas

by Dr Lynn Chiam

Dr Lynn Chiam is a Consultant Dermatologist at the Children and Adult Skin Hair Laser Clinic at Mount Elizabeth Novena Specialist Medical Centre. She completed her specialist training in dermatology at the National Skin Centre, Singapore. She is an accredited dermatologist and is a Fellow of the Academy of Medicine (Dermatology), Singapore. Dr Lynn Chiam received the Health Manpower Development Programme Award in 2009 for her fellowship in paediatric dermatology at the Department of Dermatology, Radboud University, Nijmegen Medical Centre, the Netherlands. She was actively involved in setting up the Eczema Support Group with the goal of helping patients and their families cope with this skin condition. She is currently a Medical Advisor to the Eczema Support Group.

Eczema is the most common skin condition in Singapore and it affects one in five school-going children locally.[1] Most children present with symptoms of recurrent rash and itch before the age of seven years. Atopic eczema has been increasing in Asia due to rapid urbanisation and industrialisation.

Genetics of Atopic Eczema

Atopic eczema is a heterogeneous disease reflecting a complex interplay of genetics, skin barrier, the immune system and environmental factors. Although the understanding of its pathogenesis is still evolving, research in the last decade has shown that the problem may start with a defective skin barrier.

The epidermis, or more specifically, the stratum corneum (which was once thought to be only dead layers of skin), acts as the permeability and antimicrobial barrier. The stratum corneum comprises a multi-layered tissue composed of vertically-stacked arrays of anucleate corneocytes embedded in a hydrophobic extracellular matrix filled with lamellar bilayers.

Filaggrin gene mutations have been highlighted as the major predisposing factor for atopic eczema and its associated atopic diseases, such as allergic rhinitis and asthma.[2,3] Mutations in the filaggrin gene result in the absence or reduction of the filaggrin protein and lead to a compromised skin barrier that allows the entry of allergens to trigger an immunological response. Mutations in the filaggrin gene are strongly associated with:

- a severe form of dry skin known as ichthyosis vulgaris
- eczema

Filaggrin breaks down to form natural moisturising factors (NMFs) which are essential for stratum corneum hydration. A lack of filaggrin leads to:

- disruption of the skin barrier, increased transepidermal water loss (TEWL)
- consequent dryness
- easy penetration of triggers and allergens
- sensitivity/intolerance to various irritants

It is interesting to note that permeability barrier abnormality parallels disease severity, and clinically-uninvolved skin in atopic dermatitis (AD) displays barrier abnormalities.

In eczema, there is impaired stratum corneum lipids, with decreased production of ceramides. Ceramides play a pivotal role in the structural integrity of the skin. They are involved in cellular proliferation, differentiation and programmed cell death.

Itch is one of the most common and disturbing symptoms of eczema. Itch is secondary to cytokines found in the skin of eczema patients. Interleukin (IL)-3 has been found to be over-expressed in the skin of eczema patients and its serum levels correlate with eczema severity. IL-31 induces pro-inflammatory cytokines which can lead to itch.

Extrinsic Factors

Apart from intrinsic/genetic factors, extrinsic factors are also important in the pathogenesis of eczema. Home dust mites are the most common allergen in Singapore. Unlike the Western world, pollen allergy is uncommon in Singapore. Other factors like heat sweat and harsh soaps can also trigger a flare of eczema.

Food allergy, though popularly thought to be a trigger, is not as common as we think. True food allergies are seen in about 5% of Singaporean children. Unlike in the West, peanut and fish allergies are very rare.

Management of Atopic Eczema

Rehydration of the stratum corneum is essential in the management of atopic eczema. Moisturising the skin regularly aids in restoring the impaired barrier function of the epidermis. Moisturisers not only reduce the itch of dry skin but also increase the efficacy of topical steroids and can have a steroid-sparing effect.

Ceramide-containing moisturisers can repair lipids found in the skin and have been shown to alleviate childhood atopic dermatitis. Regular use of these moisturisers can lead to a decrease in TEWL and in the severity of eczema. In children with moderate to severe atopic dermatitis, a ceramide-dominant triple-lipid barrier formulation significantly decreased skin symptoms and pruritus after one month.[5]

Topical steroids remain the mainstay of treatment and work by reducing the inflammation and itch of eczema. Topical steroids can be divided into different classes according to potency. The type of steroid to use depends on the site and severity of lesions. In general, mild steroids are used on the face, neck, groin and axilla, while potent steroids are used on thick, lichenified or discoid/vesicular lesions. About 0.5g of steroid (roughly measuring from the tip of an adult index finger to the first crease) is sufficient to cover a rash the size of two palms.

Figure 1. ***Eczema with excoriated plaques involving the popliteal fossa and shins.***

Figure 2. ***Eczema with xerosis involving the lower back.***

Moisturising the skin regularly aids in restoring the impaired barrier function of the epidermis. Moisturisers not only reduce the itch of dry skin but also increase the efficacy of topical steroids and can have a steroid-sparing effect.