

A LONGITUDINAL COHORT STUDY OF TRANSEPIDERMAL WATER LOSS IN THE FIRST SIX MONTHS OF LIFE AS A PREDICTOR OF SUBSEQUENT ATOPIC DERMATITIS

C. McCarthy^{1,2}, A. Gallagher¹, H. Smith¹, J. Connolly¹, E. Cobbe¹, D. Sheehan¹, D. Murray^{1,3}, A.D. Irvine^{2,3}, J. O'B. Hourihane^{1,3}

¹*Paediatrics and Child Health, Cork University Hospital, Cork, ²Dermatology, Trinity College Dublin, ³National Children's Research Centre, Crumlin, Dublin, Ireland*

Background and aims: Impaired skin barrier function is a feature of atopic dermatitis (AD). Transepidermal Water Loss (TEWL) represents a non-invasive measurement of skin barrier integrity. We sought to identify if elevated TEWL measurements at 2 days, 2 months and 6 months of life could predict the development of AD.

Methods: 211 participants were recruited from BASELINE, an ongoing birth cohort study. TEWL was measured at 2 days, 2 months and 6 months. Standardised questionnaires for AD were completed at 6 months of age. Complete physical examination was carried out in all cases.

Results: TEWL increased significantly from day 2 to 2 months (mean increase 4.18gH₂O/m²/hr, $p < 0.001$). This increase was greater in those who met diagnostic criteria for AD at 6 months (mean increase 7.55gH₂O/m²/hr, $p < 0.001$). TEWL did not significantly increase between 2 and 6 months of life (mean difference -0.1gH₂O/m²/hr, $p = 0.872$). While TEWL at 2 and 6 months was more likely to be increased in those with AD ($p = 0.027$ at 2 months and 0.004 at 6 months), an isolated elevated TEWL measurement at 2 days of life was not shown to predict AD development ($p = 0.091$).

Conclusions: Increased TEWL at 6 months is understandably associated with AD at the same age. Infants who develop AD by 6 months of age have an elevated TEWL by 2 months of age. However, it is the rate of change in TEWL in the first 2 months of life rather than any absolute value that better predicts the subsequent development of AD.