Title: How often are bath emollients prescribed to children with atopic eczema in primary care in England? A cross-sectional study.

Word Count: 744 + one Figure

Authors: Ganatra, N[1]; Ban, L[1,2,3]; Harman, K[1]; Thomas, K[1]

Institutions and affiliations:

1) Centre of Evidence Based Dermatology, University of Nottingham, King's Meadow Campus, Lenton Lane, Nottingham NG7 2NR.
2) NIHR Nottingham BRC, Nottingham University Hospitals NHS Trust and the University of Nottingham, Nottingham, UK.
3) Nottingham Digestive Diseases Centre, School of Medicine, University of Nottingham, Nottingham, UK.

Corresponding Author: Prof. Kim Thomas, mszkst@nottingham.ac.uk, Orcid ID: 0000 0001 7785 7465. Centre of Evidence Based Dermatology, University of Nottingham, King's Meadow Campus, Lenton Lane, Nottingham NG7 2NR.

Funding sources: None.

Conflicts of Interest: None Declared.

Ethical Approval: Study approval was granted by the CPRD Independent Scientific Advisory Committee (protocol no. 16_056A2).

Dear Editor, atopic eczema is one of the most burdensome skin diseases across the globe[1] and affects up to 20% of children in the UK. The mainstay of treatment is regular use of emollients[2] including leave-on emollients, soap substitutes and emollient bath additives. However, the lack of evidence to support the use of bath additives has led some to question their role in atopic eczema management[3]. A recently published, independent, randomised controlled trial has provided robust evidence that bath emollients provide no meaningful benefit in addition to standard care (regular use of leave-on emollients and avoidance of soap)[4].

The aim of this study was to examine the proportion of children in England with atopic eczema who are currently prescribed bath emollients in primary care, and to describe how this proportion varies according to socio-demographic factors.

Pseudonymised primary care data from the Hospital Episode Statistics-linked Clinical Practice Research Datalink (HES-linked CPRD) were used to conduct this cross-sectional observational study. A cohort of children with atopic eczema was identified from the CPRD dataset[5] defined using validated diagnostic criteria[6]. From this initial cohort, only children with active eczema were included in the study, defined as those given either a diagnosis of eczema or an eczema-related treatment between 1st April 2014 and 31st March 2015. Age, gender, ethnicity, and socioeconomic deprivation (measured using quintiles of the English Index of Multiple Deprivation) were extracted. Since the quality of ethnicity data in the HES-linked CPRD population is only comparable to Office for National Statistics data for those registered with their GPs after 1st January 2006[7], we excluded children registered before this date and thus the eldest child was aged 9 by the study end date. Disease severity was estimated based on the overall potency of treatments prescribed, broadly following the stepped approach recommended by the National Institute of Health and Care Excellence (NICE)[2]. In brief, those receiving only emollients were classed as having very mild eczema, while those receiving potent topical steroids or referred to a dermatologist were deemed to have severe eczema.

Emollient prescriptions issued to our cohort within the study dates were classified as either "leave-on" or "bath emollients." We calculated the proportion of children prescribed each emollient type and compared the proportion across different socio-demographic groups using logistic regression to generate odds ratios (OR) and 95% confidence intervals (CI).

A total of 13,618 children with active eczema were identified: 54% male, 75% white ethnicity with proportionally more younger children (36% <2 years, 40% 3-5 years and 25% 6-9 years).

We found that 34% of children with active atopic eczema were prescribed a bath emollient by their GP during the one-year study period (29% received both bath and leave-on emollients and 5% received a bath emollient without a leave-on emollient). Overall, 75% of children received a leave-on emollient and 20% received neither a leave-on nor a bath emollient.

Age had the greatest impact on prescription rates of bath emollients. Children aged ≤2 years-old were nearly twice as likely to receive bath emollients as those aged 6-9 (43% vs 24%, OR=0.41, 95% CI 0.37-0.45, Figure 1). This may be reflective of older children being more likely to shower than bathe.

Those most socioeconomically deprived were more likely to be prescribed bath emollients than those least deprived (37% vs 29% OR=1.40, 95% CI 1.25-1.56). One possible explanation is that those less deprived are purchasing their emollients over-the-counter, which are not counted in this study.

We found no meaningful differences in prescription rates according to disease severity, gender, or ethnic group.

The strengths of this study lie in the large sample size, allowing us to obtain accurate estimates at a population level[8]. However, we could not account for emollients purchased over-the-counter or shared amongst family members. Further, this study only assessed whether emollients were prescribed at all; it did not examine the quantity or frequency of prescriptions.

In conclusion, one-third of children in England with atopic eczema were prescribed emollient bath additives. Since recent evidence suggests that bath emollients provide little benefit in the management of eczema in addition to standard management[4], this study highlights an area for possible reinvestment in more cost-effective treatments, such as leave-on emollients. It is concerning that up to 25% of children may be receiving sub-optimal emollient therapy: either no emollient at all, or bath emollients prescribed without concurrent leave-on emollients. Care should be taken to ensure that children have access to adequate quantities of leave-on emollients and soap substitutes, which remain the mainstay of treatment for atopic eczema.

1. Hay RJ, Johns NE, Williams HC, et al. The Global Burden of Skin Disease in 2010: An Analysis of the Prevalence and Impact of Skin Conditions. J Invest Dermatol [Internet]. 2014 [cited 2017 Oct 27];134446(10):1527–34. Available from: https://ac.els-cdn.com/S0022202X15368275/1-s2.0-S0022202X15368275-main.pdf?_tid=d72f49fc-bb1d-11e7-aa74-00000aab0f6c&acdnat=1509112429_53c37d03f3ba2a134bea74bc2340a71c

2. NICE. Atopic eczema in under 12s: diagnosis Atopic eczema in under 12s: diagnosis and management and management Clinical guideline Y Your responsibility our responsibility [Internet]. 2007 [cited 2017 Oct 28]. Available from: https://www.nice.org.uk/guidance/cg57/resources/atopic-eczema-in-under-12s-diagnosis-and-management-pdf-975512529349

3. Drug and Therapeutics Bulletin. Bath emollients for atopic eczema: why use them? Drug Ther Bull [Internet]. 2007 Oct 1 [cited 2018 Jan 1];45(10):73–5. Available from: http://www.ncbi.nlm.nih.gov/pubmed/17928284

4. Santer M, Ridd MJ, Francis NA, et al. Emollient bath additives for the treatment of childhood eczema (BATHE): multicentre pragmatic parallel group randomised controlled trial of clinical and cost effectiveness. BMJ [Internet]. 2018 May 3;361. Available from: http://www.bmj.com/content/361/bmj.k1332.abstract

5. Ban L, Langan SM, Abuabara K, et al. Incidence and sociodemographic characteristics of eczema diagnosis in children: a cohort study. J Allergy Clin Immunol. 2017;

6. Abuabara K, Magyari AM, Hoffstad O, et al. Development and Validation of an Algorithm to Accurately Identify Atopic Eczema Patients in Primary Care Electronic Health Records from the UK. J Invest Dermatol [Internet]. 2017 Aug [cited 2017 Dec 7];137(8):1655–62. Available from: http://www.ncbi.nlm.nih.gov/pubmed/28428130

7. Mathur R, Bhaskaran K, Chaturvedi N, et al. Completeness and usability of ethnicity data in UK-based primary care and hospital databases. J Public Health (Oxf) [Internet]. 2014 Dec [cited 2017 Oct 28];36(4):684–92. Available from: https://academic.oup.com/jpubhealth/article-lookup/doi/10.1093/pubmed/fdt116

8. Herrett E, Gallagher AM, Bhaskaran K, et al. Data Resource Profile: Clinical Practice Research Datalink (CPRD). Int J Epidemiol [Internet]. 2015 Jun 1 [cited 2017 Oct 28];44(3):827–36. Available from: https://academic.oup.com/ije/article-lookup/doi/10.1093/ije/dyv098