



care with screening for associated diseases. A national clinical audit based on the audit standards set in the guidelines has just been completed and the results will help in further dissemination of the BAD recommendations. Several challenges remain, such as management of an acute flare and development of surgical options.

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High incidence of hand eczema in Danish schoolchildren following intensive hand hygiene during the COVID-19 pandemic: a nationwide questionnaire study

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DEAR EDITOR, During the COVID-19 pandemic of spring 2020, Denmark was one of the first countries to introduce lockdown

measures. This included closing of all schools throughout Denmark by 16 March 2020. Primary schools were reopened on 15 April 2020 for grades zero to five. Specific hand hygiene guidelines were issued by the Danish Health Authority to prevent the transmission of coronavirus: children were instructed to wash their hands for 45–60 seconds with water and soap at least every 2 hours and specifically upon arrival at school, before and after meals, after toilet visits, after coughing or sneezing and whenever the hands were visibly dirty.¹ Soon after the reopening of schools, we witnessed a disturbing increase in young children presenting with hand eczema.

We examined the incidence of hand eczema along with risk factors for the development of hand eczema among Danish schoolchildren aged 5–13 years (grades zero to five of the Danish school system) during the COVID-19 pandemic. The study was designed as a 100% anonymous parental self-administered survey. The heads of all municipal and private primary schools in Denmark were contacted by email and asked to forward a link to the questionnaire to the parents of all children attending grades zero to five. The questionnaire was sent out on 28 April 2020 and closed for responses after exactly 1 week.

Parents of 32 038 children returned the questionnaire. Responses missing answers regarding sex or age were deleted from the dataset. The final sample consisted of 31 037 children and represented 10% of the total number of children enrolled in grades zero to five.² Girls accounted for 50.4% (15 654), the children were 5–13 years old (mean 8.7 ± 1.83 years) and 17.5% (5417 of 31 037) had experienced previous or current atopic dermatitis, defined by an affirmative answer to the question, 'Did a doctor ever tell you that your child has atopic dermatitis?'

Overall, 6.5% [2000 of 30 907; 95% confidence interval (CI) 6.2–6.8] of the children had hand eczema before schools closed. Another 7.6% (2363 of 30 907; 95% CI 7.4–7.9) developed hand eczema while schools were closed, meaning that 14.1% (4363 of 30 907; 95% CI 13.7–14.5) had hand eczema before reopening of schools on 15 April 2020. This prevalence increased to 50.5% (15 595 of 30 907; 95% CI 49.9–51.0) after the children returned to school and the strict hand hygiene regimen was implemented, which was a statistically significant increase of 36.3% ($P < 0.001$).

Among the children who did not have hand eczema before the reopening of schools, 40.9% (10 491 of 25 672; 95% CI 40.1–41.7) developed hand eczema after returning to school. In 62.3% (6514 of 10 462; 95% CI 60.8–63.8) hand eczema occurred within 3 days. The risk of developing hand eczema was significantly and strongly associated with atopic dermatitis (adjusted odds ratio 2.14, 95% CI 1.99–2.30), and moderately with female sex (adjusted OR 1.34, 95% CI 1.28–1.41), younger age and frequency of handwashing (Table 1). A linear regression with the number of handwashes as an explanatory variable gave an estimated coefficient of 0.013 (SE 0.003).

Knowing the aetiopathomechanisms of irritant contact dermatitis, a sudden and dramatic epidemic of hand eczema in children was predictable. The risk of developing hand eczema

Table 1 The risk of incident hand eczema adjusted for sex, atopic dermatitis, age and frequency of handwashing after returning to school

Explanatory variables	Hand eczema, % (n/N) ^a	OR (95% CI)	P-value
Sex			
Female	44.4 (5648/12 710)	1.34 (1.28–1.41)	< 0.001
Male	37.4 (4843/12 962)	1 (ref)	
Atopic dermatitis			
Yes	56.9 (2062/3622)	2.14 (1.99–2.30)	< 0.001
No	38.2 (8429/22 050)	1 (ref)	
Age (years)			
5–7	42.4 (3225/7614)	1.23 (1.14–1.32)	< 0.001
8–10	41.5 (5316/12 816)	1.19 (1.12–1.28)	< 0.001
11–13	37.2 (1950/5242)	1 (ref)	
Handwashes per day after returning to school on 15 April 2020 ^b			
6	33 (5/15)	0.62 (0.21–1.86)	0.4
7–9	42.0 (1121/2669)	1 (ref)	
10–12	39.7 (4121/10 380)	0.90 (0.83–0.99)	0.03
13–15	39.9 (2821/7069)	0.92 (0.84–1.00)	0.06
16–18	41.5 (1508/3638)	0.97 (0.88–1.08)	0.59
19–21	45.7 (520/1138)	1.15 (0.99–1.32)	0.06
> 21	52.1 (381/732)	1.51 (1.28–1.78)	< 0.001

CI, confidence interval; OR, odds ratio; ref, reference value. ^aHand eczema defined as incident cases of hand eczema (i.e. children without previous hand eczema). ^bLinear regression with number of handwashes as an explanatory variable gives an estimated coefficient of 0.013 with a corresponding standard error of 0.003.

was significantly associated with atopic dermatitis, female sex and younger age. A history of atopic dermatitis and young age at onset are both important risk factors for a long-term poor prognosis of hand eczema,³ which is why preventive measures are particularly important in this subgroup of children. Previous experimental studies cannot confirm any sex difference in acute or cumulative irritant reactivity.⁴ In our study there may have been behavioural differences, for example girls may wash their hands more thoroughly and more often.

A limitation of the study is that we have no information regarding the participation rate and nonresponders. Further, the high prevalence of hand eczema of 40.9% raises concern for participation bias. However, the atopic dermatitis and hand eczema prevalence estimates are very similar to previous ones from other studies.^{5–7}

The occurrence of hand eczema in children does not only have immediate implications, but may also have serious long-term consequences. Repeated skin exposure to even weak irritants, each starting before complete recovery from the previous insult, will eventually lead to chronic irritant contact dermatitis.⁸ The guidelines for hand hygiene were implemented without proper information on correct handwashing and skin protection remedies to teachers, school staff, parents or children. Prophylactic measures such as instructions on how to perform correct handwashing, emphasis on the use of hand sanitizers as a gentler hygiene measure and instructions on systematic use of emollient cream following handwashing could have spared a proportion of the children from developing hand eczema. Finally, it remains unknown to what degree the intensive hand hygiene regimen prevented coronavirus transmission among Danish schoolchildren.

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