

Colophony-induced contact dermatitis due to ECG electrodes in an infant

Contact Dermatitis 2007; 56: 177–178

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Key words: allergic contact dermatitis; colophony; ECG; electrode; infant; patch testing.

Contact dermatitis from electrocardiogram electrodes has been repeatedly reported lately (1–3). Allergic and irritant origins are being discussed.

Case Story

A 5-month-old female infant underwent continuous ECG monitoring at home for the prevention of sudden infant death. Self-adhesive prewired paediatric monitoring electrodes (Kendall KittyCat Foam 4203; Tyco Healthcare, Chicopee, MA, USA) were fixed to the chest wall. One electrode was used for up to 4 days. 4 weeks after initial use, confluent erythematous papules developed at the electrode sites. Similar symptoms developed when using another electrode type (Kendall Arbo Premie H87P; Tyco Healthcare).

The contact area of both types of Ag/AgCl electrodes is coated with a conductive adhesive hydrogel—contains synthetic polymers and acrylate adhesives. Patch testing with possible contact allergens was performed. According to the Guidelines of the German Contact Dermatitis Research Group (DKG), colophony

20% pet., p-tert-butylphenol-formaldehyde resin 1% pet., propylene glycol 20% aqueous, hydroxyethyl methacrylate 1% pet., methyl methacrylate 2% pet. and the adhesive electrodes were tested. 72-hr scoring showed a twofold positive reaction to colophony and positive reactions to both sides of the first electrode and the adhesive side of the second electrode. All other substances tested negative.

There was no previous history of atopy in the infant. The mother was known to suffer from allergic rhinitis.

Discussion

The frequency of allergic contact dermatitis in children is often underestimated (4). We could detect positive patch test reactions to adhesive ECG electrodes due to colophony in an infant. According to the manufacturer, colophony is not a regular part of the electrode hydrogel. However, colophony is used when soldering the electrode cables and metal contact plates. Long occlusive skin contact may well dissolve the colophony residues within the contact gel. As a consequence, unsoldered monitoring electrodes (Kendall Arbo Premie H207PGT; Tyco Healthcare) were used for further monitoring of the infant. The contact sites remained unremarkable from then on. To our knowledge, this is the first report of an allergic contact dermatitis due to colophony in an ECG electrode.

Propylene glycol (1) is a common trigger of allergic contact dermatitis in adhesive ECG electrodes. Propylene glycol is often part of the hydrogel. Acrylates (2) and p-tert-butylphenol-formaldehyde resin (3) could also be identified as hidden allergens in ECG electrodes. In our case, no type IV sensitization to these substances was detected.

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