

Contact allergy and hand eczema in Swedish dentists

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Hand eczema and contact allergy in Swedish dentists were studied in a multidisciplinary project. The aims of the study were to establish diagnoses, to investigate the occurrence of contact allergy, in particular to (meth)acrylates, and to evaluate certain consequences of hand eczema. A postal questionnaire on skin symptoms, atopy and occupational experience was mailed to 3500 dentists aged <65 years, and licensed 1965–1995. The response rate was 88%. Among dentists living in 3 major cities, 14.9% ($n=191$) reported hand eczema during the previous year. They were invited to a clinical examination, including patch testing with a standard and a dental series. 158/191 (83%) dentists attended, and hand eczema diagnosis was confirmed in 149/158 (94%). Irritant contact dermatitis was diagnosed in 67% and allergic contact dermatitis in 28%. On patch testing, 50% presented at least 1 positive reaction. The most frequent allergens were nickel sulfate, fragrance mix, gold sodium thiosulfate and thiuram mix. 7 (5%) had positive reactions to (meth)acrylates, all to 2-hydroxyethyl methacrylate and 6 also to ethyleneglycol dimethacrylate. 38% had consulted a physician, 4% had been on sick-leave and 1% had changed occupational tasks due to hand eczema. No dentist with allergy to acrylates had been on sick-leave or changed occupation. It is concluded that dentistry is a high-risk occupation for hand eczema, and that irritant contact dermatitis is most common. The prevalence of contact allergy to acrylates was below 1% in the population of responding dentists, and in most cases did not have serious medical, social or occupational consequences.

Key words: contact allergy; dentist; epidemiology; hand eczema; (meth)acrylates; wet work.
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During the past 10 years, several reports on allergy to (meth)acrylates in dental personnel have been published (1–3). In Sweden, the Board for Occupational Safety and Health has increasingly registered notifications of occupational skin disease among dental staff (4).

Frequent hand washing, and the use of protective gloves many hours a day (5), contribute to an unfavourable environment for the skin of the hands. In their work, dentists also use several products that can cause contact allergy and/or irritation of skin and mucous membranes. Metals such as nickel, gold, chromium, cobalt, palladium and mercury are found in instruments and in metal-based dental materials. Rubber chemicals and natural rubber latex (NRL) occur in gloves and in rubber dams. Acrylic and methacrylic

based materials (hereafter referred to as (meth)acrylates) can be found in composite restorative materials, bonding agents and dentures.

There is growing awareness among Swedish dentists of the allergenic potential of (meth)acrylate monomers. It is, however, at present impossible to avoid contact completely with uncured (meth)acrylates, due to imperfect packages and working practice. Also, protective gloves of NRL and polyvinyl chloride (PVC) are inadequate, due to rapid penetration of (meth)acrylate monomers (6–7).

To investigate the problem of contact allergy and hand eczema among dentists further, a multidisciplinary project has been initiated. This is, as far as we know, the 1st published population-based study of dentists, where questionnaire data has been followed up by clinical examination and patch test-

ing. The project includes a large questionnaire study (8), where self-reported hand eczema was assessed, and a clinical investigation of those dentists who reported hand eczema in the previous 12 months.

The aims of this study were to establish diagnoses, to investigate the occurrence of contact allergy, and to evaluate certain consequences of hand eczema in Swedish dentists.

Subjects, Materials and Methods

Study population

From the register of licensed dentists ($n=10,621$), kept by the National Board of Health and Welfare in Sweden, 3500 dentists aged below 65 years were randomly selected. They were all licensed between 1965 and 1995, to cover the period during which (meth)acrylates have been in common use. The female/male ratio was 0.86 (1616/1884). The study was approved by the Ethics Committees of the Karolinska Institute, Stockholm, Göteborg University and Lund University.

Questionnaire

A postal questionnaire was sent to the selected dentists in 1996. It included questions about hand eczema and other skin symptoms, childhood eczema, previous patch testing, respiratory symptoms and occupational experience. The questions on hand eczema had been used in several previous studies (9–11). After 3 reminders, the total response rate was 88%. The 1-year prevalence of self-reported hand eczema was 13.5%, 14.4% in females and 12.7% in males. Detailed results have been presented recently (8). Among dentists in the 3 largest Swedish cities (see below), the 1-year prevalence of self-reported hand eczema was 14.9 %, i.e., slightly higher than the national average.

Dermatological examination

Of all responders in the Stockholm, Göteborg and Malmö areas ($n=1287$), those who had given an affirmative answer to the question, "Have you experienced hand eczema on any occasion during the last 12 months?" ($n=191$), were invited to a dermatological examination. 158 (83%) of these dentists attended. Among those who did not attend, 2 had died, 2 suffered from other illnesses, 7 had moved from the area and 22 refused to participate. The clinical examinations, which took place in 1997–98, included a standardized interview, registration of clinical skin signs, and patch testing. 4 experienced dermatologists (BB, BM, L-MW and KW), performed the dermatological examinations.

Morphology of hand eczema

Clinical skin signs on the hands were recorded at the examination (Table 1). Morphological criteria for eczema were defined as erythema and papules/vesicles, or as erythema, scaling and fissures, with or without papules/vesicles.

Patch testing

Patch testing was performed with the Swedish standard series, and a dental screening series (metallic titanium added). The test substances were supplied by Chemotechnique Diagnostics AB, Sweden. Finn Chambers (Epitest Ltd Oy, Finland) and Scanpor tape (Norgesplaster a/s, Norway) were used for substance application. The test patches were removed after 2 days and the reactions were assessed 3 days after application. A 2nd reading was not practicable because of the population-based design of the study. The test results were classified according to established methods (12). Documented patch test results were accepted if they had been performed within 3 years of the dermatological examination (14 cases). A complementary patch test, with substances not tested previously, was applied when necessary.

Diagnoses

To distinguish between different types of hand eczema, we used the overall information on history, morphology, location, course over time, atopy history, exposure, and, when available, results of

Table 1. Clinical skin signs on the hands, as registered at the clinical examination of dentists with hand eczema diagnosis ($n=149$)

Signs	Female (n)	Male (n)	Total (n)
erythema	32	37	69
scaling	30	46	76
papules/vesicles	9	12	21
fissures	20	16	36

Table 2. Combination of clinical skin signs on the hands, as registered at the clinical examination of dentists with hand eczema diagnosis ($n=149$)

Combination of signs ^{a)}	Female (n)	Male (n)	Total (n)
erythema, scaling and fissures	8	7	15
erythema and papules/vesicles	5	7	12
erythema, scaling, fissures and papules/vesicles	1	5	6

^{a)} Fulfilling the morphological criteria for eczema, defined in *Methods, morphology of hand eczema*.

Table 3. Duration and onset of hand eczema, in relation to history of skin atopy

	All (n=149)	History of skin atopy (n=50)	No history of skin atopy (n=99)
duration of hand eczema (median, years)	7	13 ^{a)}	6
range (years)	(1–54)	(1–54)	(1–43)
age at onset of hand eczema (median, years)	36	28 ^{a)}	38
range (years)	(0–56)	(0–54)	(5–56)
onset of hand eczema, after beginning to work in dentistry (median, years)	8	2 ^{b)}	9
range (years) ^{c)}	(0–28)	(0–28)	(0–28)

^{a)} Statistically significant difference compared to those without skin atopy ($P<0.0001$).

^{b)} Statistically significant difference compared to those without skin atopy ($P=0.0006$).

^{c)} In 17 dentists with a history of skin atopy, and in 12 without, hand eczema started before work in dentistry.

patch testing. The concept of hand eczema included allergic contact dermatitis, irritant contact dermatitis, atopic hand eczema, hyperkeratotic palmar eczema, pompholyx and unclassified hand eczema.

Allergic contact dermatitis required a positive

patch test and a history of present exposure to the allergen.

Irritant contact dermatitis was used for cases with a history of exposure to water and other skin irritants and periods of eczema related in time to such exposure (13).

Table 4. Positive patch test reactions to substances in the standard and dental series

Substance	Concentration (%)	Female (n=82) (%)	Male (n=65) (%)	Total (n=147) (%)
nickel sulfate	5.0	23	8	16
fragrance mix	8.0	10	9	10
gold sodium thiosulfate ^{a)}	0.5	13	2	9
thiuram mix	1.0	7	8	7
potassium dichromate	0.5	7	5	7
Myroxylon Pereirae	25.0	7	2	5
cobalt chloride	0.5	6	3	5
2-hydroxyethyl methacrylate	2.0	4	6	5
mercury	0.5	7	2	5
palladium chloride	2.0	9	0	5
MCI/MI	0.02	4	5	4
ethyleneglycol dimethacrylate	2.0	4	5	4
lichen acid mix	0.3	2	5	3
colophonium	20.0	2	2	2
methyl methacrylate	2.0	0	5	2
tixocortol-21-pivalate ^{b)}	1.0	1	2	2
Amerchol L-101	50.0	1	0	1
caine mix II	10.0	1	2	1
copper sulfate	2.0	0	2	1
diazolidinyl urea	2.0	0	2	1
epoxy resin	1.0	1	0	1
ethylenediamine dihydrochloride	1.0	0	3	1
eugenol	2.0	1	0	1
formaldehyde	1.0	0	2	1
mercapto mix	2.0	0	2	1
methylhydroquinone	1.0	0	2	1
neomycin sulfate	20.0	2	0	1
parabens	15.0	0	2	1
primin	0.01	2	0	1
4-tert-butylphenol-formaldehyde resin	1.0	0	2	1
tetrahydrofurfuryl methacrylate	2.0	0	3	1
tosylamide/formaldehyde resin	10.0	0	2	1
urethane dimethacrylate	2.0	0	2	1

38 persons had 1 positive reaction, 16 had 2, 9 had 3, 5 had 4 and 6 had 5 or more positive reactions. Petrolatum was used as vehicle for all substances except formaldehyde, diazolidinyl urea and MCI/MI, where water was used.

^{a)} 117 dentists tested, 68 female and 49 male.

^{b)} 144 dentists tested, 81 female and 63 male.

Atopic hand eczema required a history of previous or present atopic dermatitis at other body sites.

Hyperkeratotic palmar eczema was diagnosed when hyperkeratotic, fissured patches were present on the palms and palmar surfaces of the fingers, and no vesicles were found.

Pompholyx was identified when there was a sudden onset of crops of itching vesicles, sometimes developing into bullae, on the palms. No external exposure was determined.

Unclassified hand eczema was used when none of the above-mentioned types of hand eczema could be diagnosed.

Statistical methods

For comparisons between 2 proportions, and for confidence intervals, the χ^2 test and the standard normal approximation test were used (14). For continuous variables, the Wilcoxon rank sum test was used.

Results

Clinical examination

Hand eczema diagnosis was confirmed in 149/158 (94%) of the dentists examined. 5 had not had hand eczema in the previous 12 months, 2 suffered from

tinea infection and 2 had psoriasis. The 149 cases of hand eczema were diagnosed among 1287 dentists in the Stockholm, Göteborg and Malmö areas, yielding a minimum 1-year prevalence of 11.6%. Assuming that 94% of the non-attenders had hand eczema too, the 1-year prevalence would be 14% ($0.94 \times 191/1287$) (95% confidence interval 12–16%). The female/male ratio was 1.2 (82/67), and the mean age was 44 years (range 29–58) for female dentists and 47 years (range 32–60) for male dentists.

At the time of clinical examination, clinical skin signs were registered in 101/149 (68%) dentists. The signs observed on clinical examination are presented in Table 1. Combinations of signs fulfilling the morphological criteria for eczema (erythema and papules/vesicles, or erythema, scaling and fissures, with or without papules/vesicles; see "Methods"), were present in 33 (22%) individuals (Table 2).

The mean duration of hand eczema, from the 1st symptoms to the time of examination, was 11 years, and the mean age at 1st appearance was 35 years. Hand eczema started on average 7 years after starting to work in dentistry. Continuous symptoms were reported by 27 (18%) dentists, and 50 (34%) had a history of childhood eczema. For 34% of the dentists with skin atopy, and for 12% of the dentists without skin atopy, the onset of hand

Table 5. Positive patch test reactions in dentists with (meth)acrylate allergy

Case no.	Sex	2-hydroxyethyl methacrylate	Ethyleneglycol dimethacrylate	Methyl methacrylate	Tetrahydrofurfuryl methacrylate	Urethane dimethacrylate	Other positive patch test reactions
1	f	+++	+++	—	—	—	—
2	f	++	+	—	—	—	—
3	f	++	++	—	—	—	—
4	m	+++	—	+++	+	+++	—
5	m	++	++	+	—	—	—
							MCI/MI+ potassium dichromate+
6	m	++	+	—	—	—	—
7	m	+++	+++	++	++	—	—

Positive¹²=+++ , ++ , +.

Negative¹²=—.

Table 6. Dentists with (meth)acrylate allergy – clinical data

Case no.	Sex	Occupational activity	Years in occupation	Duration of hand eczema (years)	History of atopic dermatitis	Medical consultations (number)	Sick-leave	Change of task(s)/ occupation
1	f	a	17	3	+	2–5	—	—
2	f	b	9	3	—	—	—	—
3	f	b	30	2	—	—	—	—
4	m	b	15	2	—	—	—	—
5	m	b	21	2	+	2–5	—	—
6	m	b	11	27	+	—	—	—
7	m	b	25	4	—	2–5	—	—

a: Public health dentistry.

b: Private practice.

Table 7. Number and distribution of different types of hand eczema, registered at the dermatological examination

Type of hand eczema	Female (n=82)		Male (n=67)		Total (n=149)	
	n	(%)	n	(%)	n	(%)
irritant contact dermatitis	63	77	37	55	100	67
allergic contact dermatitis	23	28	18	27	41	28
atopic hand eczema	20	24	17	25	37	25
unclassified hand eczema	1	1	13	19	14	9
hyperkeratotic palmar eczema	1	1	0	0	1	1

Concurrent diagnoses were registered in 41% of the cases.

eczema occurred before they began working in dentistry (Table 3).

Patch testing

50% of the 147 dentists who agreed to be patch tested presented at least 1 positive patch test reaction, 56% of the females and 43% of the males. In 60 dentists, 107 reactions were found to substances in the standard series. In 29 persons, 46 reactions were found to substances in the dental series. Positive patch test reactions are listed in Table 4.

7 (5%) had positive reactions to (meth)acrylates. All had a positive reaction to 2-hydroxyethyl methacrylate (2-HEMA) and 6 also to ethyleneglycol dimethacrylate (EGDMA). The total pattern of positive test reactions in these individuals is shown in Table 5 and clinical data in Table 6.

Diagnoses

The diagnoses on clinical examination are presented in Table 7. 51 persons had 2 concurrent diagnoses and 10 persons had 3. The most frequent combination was irritant contact dermatitis and atopic hand eczema.

Consequences of hand eczema

56 dentists (38%) had consulted a physician for hand eczema. 19 had consulted 1×, 28 2–5× and 9 more than 5×. 6 (4%) had been on sick-leave for hand eczema. 1 period of sick-leave was reported by 4 dentists and 2–5 periods by 2, with a median of total time on sick-leave of 5 weeks (range 2–25). The diagnoses resulting in sick-leave were in 2 cases allergic contact dermatitis caused by thiurams, in 1 case contact dermatitis with allergy to several metals and to fragrances, and in 3 cases irritant contact dermatitis. All 6 reported deterioration related to the use of protective gloves.

Topical corticosteroid treatment was reported by 43% of the dentists with hand eczema. Emollient cream treatment was reported by 85%. 2 dentists had changed their occupational tasks due to glove-

related hand eczema. One focused on teaching, while the other avoided surgical treatments. However, none of the dentists examined had changed their occupation due to hand eczema.

Discussion

Despite recent reports on contact allergy to dental materials, in particular the (meth)acrylates (15), irritant contact dermatitis was the most common type of hand eczema in the dentists examined.

Hand eczema is a disease with a relapsing and remitting course. The results in this study confirm that hand eczema is also a disease of long duration. Especially among the dentists with skin atopy, hand eczema started early in life, and soon after their professional career had begun (Table 3). An increased prevalence of hand eczema in persons with skin atopy is well documented (16), and was also found among dentists (8).

Dentistry involves wet work, mainly due to frequent hand washing (5). An association between hand eczema and the number of working hours a day with wet hands has been indicated in other risk occupations, as well as in individuals at risk of hand eczema (17–18). Skin irritation impairs the function of the skin barrier, which also increases the risk of contact sensitization (19).

Contact allergy; allergens in the standard series

A high proportion of the dentists examined (41%) had positive patch test reactions to substances in the standard series. In a similar study of hand eczema in the general population, the corresponding proportion was 32% (10). Exposure to many of these substances, e.g. nickel and fragrances, occurs in the dentists' work environment, as well as in private life.

Nickel allergy was diagnosed in 16% of the hand eczema cases, which is comparable to results in other reports (20). Among male dentists, however, the figure was 8%, which is somewhat higher than expected, and might indicate exposure to nickel in the work environment (9). By using the dimethylglyoxime test (21), it was possible to verify

release of nickel from objects in the technical equipment used in dental practice.

Rubber chemicals, in particular the thiurams, are important occupational allergens. In a study of patients with contact allergy to rubber chemicals, protective gloves were reported to be the main cause of sensitization (22), which is probably the case in the present study as well. By using other glove materials, e.g., PVC instead of rubber, such cases could be prevented.

Allergy to fragrances, diagnosed by positive test reactions to fragrance mix, Myroxylon Pereirae and lichen mix, was common in this study, which illustrates the importance of using fragrance-free soaps and emollients at work. Eugenol, which is used in root canal therapy, in some impression materials and in temporary fillings/cements, is a well-known contact allergen (23), and 1 case of contact allergy was found in this study.

In skin care products, *the preservatives* can cause contact allergy, and the risk associated with the use of methylchloroisothiazolinone/methylisothiazolinone (MCI/MI) has been stressed (24). The present results, with 6 patch-test-positive individuals, support the recommendation that MCI/MI should be avoided in skin care products at work.

Allergy to colophonium was found in 3 cases. In dentistry today, colophonium (rosin) can be found mainly in fluoride varnish, but it is also present in zinc oxide-eugenol impression paste/cement, and in a temporary filling/periodontal dressing material (Nobetec®, Sweden). Thus, in dentistry, allergy to colophonium can be occupationally related (25–26).

Contact allergy; allergens in the dental series

Contact allergy to (meth)acrylates was found in 5% (7/147) of the dentists with hand eczema during the previous 12 months. In the Stockholm, Göteborg and Malmö areas, 1287 dentists answered the postal questionnaire, which gives a prevalence of (meth)acrylate allergy of 0.5% (7/1287), in the sample. The possibility that some dentists with (meth)acrylate allergy might not have had hand eczema during the previous 12 months was considered. From the postal questionnaires, using answers on previous hand eczema, dermatological consultations and patch test results, another 5 (meth)acrylate-sensitized individuals were identified from the sample of 1287. Telephone interviews with 4 of them revealed that 3 were still in practice, while 1 had retired early. 5 cases in the Stockholm, Göteborg and Malmö areas increased the prevalence of symptomatic contact allergy to (meth)acrylates to 0.9% (12/1287).

In modern dentistry, the majority of dental

treatments include use of (meth)acrylate-based materials. The use of (meth)acrylates in composite restoratives, bonding materials, etc., has increased in Sweden during the last 10 years, at the expense of metallic (i.e., amalgam) restorations.

Exposure to 2-HEMA is frequent because of its occurrence in the majority of bonding products, and in light-curing glass ionomers. Difficulties in the handling of bonding products increase exposure and the risk of skin contamination. We observed multiple reactions to several monomers, and some of these may be cross-reactions, e.g., for EGDMA, with many positive reactions in spite of low exposure (27). Only 1 of the (meth)acrylate-positive dentists had positive test reactions to substances other than (meth)acrylates (Table 5).

Although the total number of cases with (meth)acrylate allergy was limited (7+5), note that the onset of hand eczema in 6 cases, occurred in the mid-1990s (Table 6). If not random, this finding may indicate increased skin contact with (meth)acrylates in the 1990s, especially among dentists in private practice (Table 6).

Of the substances present in the dental series, positive reactions to *gold sodium thiosulfate* were the most frequent. Contact allergy rates to gold sodium thiosulfate in the range 1–23% have been reported in patch-test series from various countries (28). In many such cases, no history of symptoms related to exposure to gold metal in jewellery or in dental materials can be obtained, and therefore the relevance of observed positive test reactions is questioned (28). Among the dentists who were test positive to gold sodium thiosulfate, no case was found where the allergy was considered relevant to the hand eczema.

7 dentists were patch test positive to *metallic mercury*. They had been occupationally exposed to mercury in amalgam for on average 21 years. Only a few cases of occupational allergic contact dermatitis from mercury have been reported (29). In modern dentistry, the use of amalgam is limited, and with proper working routines it should be no problem for the dentist to avoid skin contact.

Severity of hand eczema

The severity of hand eczema can roughly be estimated from the consequences of the disease, e.g., need for medical care, sick-leave and change of occupation. In general, the consequences seemed to be milder in this study population than in the general population (10). However, changes in the labour market and in the social security system during the time interval between the studies might bias this comparison. A quality of life assessment can add a further dimension to the consequences of

hand eczema, but was not possible to perform in this study. Most of the (meth)acrylate-positive dentists had mild hand eczema at the time of the investigation, and were able to continue their occupation. Occasional cases of change of occupation, due to (meth)acrylate allergy in dental personnel, have been reported in the literature (2, 3). In this study, side-effects from protective gloves seemed to be the main reason for sick-leave and change of occupational tasks due to hand eczema.

Hand eczema is a disease of multifactorial etiology caused by exposure to skin irritants and in some cases to contact allergens. Genetic factors, such as atopic constitution, are also important. Exposure occurs at work as well as during leisure time. In the individual case, however, the relative importance of different factors, occupational or non-occupational, is difficult to evaluate.

Methodological aspects

In this population-based study, where questionnaire data has been followed up by clinical examination and patch testing, we have avoided the selection of individuals which usually occurs in patch-test studies performed on patients attending dermatology clinics. From selected study-populations, it is not possible to conclude that the results are valid for the dentist population as a whole.

Validity. The present clinical study was conducted among 1287 dentists who in a questionnaire study indicated that they had had hand eczema in the previous 12 months. The relatively large sample, and high response rate in the original study, admit a low *random* error (SD 1.0%) in the estimated prevalence of hand eczema (14.0%), as diagnosed by a dermatologist.

If, however, some of the dentists that denied it in the questionnaire, did in fact have hand eczema, the 1-year prevalence of hand eczema, would be higher than 14%.

Thus, there may have been a *systematic* error, yielding too low an estimate, since only those with self-reported hand eczema were clinically examined. Although the positive predictive value for the hand eczema question was high (94%), sparse data in the literature (9, 30) indicate that there may be a fair number of "false negatives". This issue can be settled only if a large number of subjects who deny having hand eczema are clinically examined. Only then can the sensitivity, specificity and true prevalence of hand eczema be calculated.

Another common systematic error in cross-sectional studies is the "healthy worker effect" which would be a problem if dentists with hand eczema left the profession (31). This was, however, avoided in the present study by selecting not only those

currently active as dentists, but all those who were licensed during a 30-year period.

Measures of prevalence. Hand eczema is a disease with a relapsing course (10). When individuals reporting hand eczema on some occasion during a 12-month period come to an examination, some lack clinical signs on the day of examination. The point prevalence using the number of individuals with at least 1 clinical skin sign on the hands on examination (Table 1) was 7.8% (101/1287). This is probably the most common way to estimate point prevalence in this type of study. Using the more strict morphological criteria for hand eczema presented in "Methods, Morphology of hand eczema", the point prevalence was 2.6% (33/1287) (Table 2).

Self-reported associations with (meth)acrylates

An interesting question is how far self-reported suspicion of association between symptoms and certain kinds of exposure tallies with clinical findings. In the postal questionnaire, 3.0% (39/1287) of the dentists in Stockholm, Göteborg and Malmö reported hand eczema during the previous 12 months, as well as skin symptoms related to composite/bonding materials. 29 of these 39 attended for clinical examination. Only in 7 cases was contact allergy to (meth)acrylates verified. In the other 22 dentists, several different diagnoses were present. Therefore, estimates of contact allergy to (meth)acrylates based on questionnaire data only (2, 5) seem to have limited value. To confirm a contact allergy diagnosis, patch testing has to be performed and the result assessed by an experienced dermatologist. Furthermore, a proper examination by a dermatologist, and patch testing, make it easier for the individual to protect the hands from relevant contact allergens.

In Sweden, the risk of sensitization to (meth)acrylates in dental staff has attracted much attention. While serious hand eczema caused by (meth)acrylate allergy may occur, our results indicate that this is a relatively rare problem, as compared to hand eczema related to wet work and the use of protective gloves. The latter issue will be addressed in a separate publication.

Conclusions

The present study shows that dentistry is a high-risk occupation for hand eczema, and that irritant contact dermatitis is the predominant diagnosis. In dentists with hand eczema, contact allergy was diagnosed in 1/2 the cases, mainly to common allergens such as nickel, fragrance and rubber chemicals, but also to some dental materials. The preva-

lence of contact allergy to (meth)acrylates was below 1%, and most cases did not have serious medical, social or occupational consequences. Nevertheless, the (meth)acrylates are important contact allergens, and should be handled with greatest precaution. Moreover, the need for minute skin care and skin protection in dentistry should be emphasized.

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