

Skin conditions in instrumental musicians: a self-reported survey

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Background: Instrumental musicians are a risk group for a variety of skin conditions.

Objectives: To determine the frequency and risk factors of instrument-related skin disorders in musicians.

Method: We mailed an 11-item survey to 19 German universities of music and performing arts.

Results: 412 musicians returned the completed questionnaire, of whom 21.6% (89/412) had an instrument-related skin disorder including callosities (52/89; 58.4%), contact dermatitis (CD; 17/89; 19.1%), fiddler's neck (17/89; 19.1%), and erosion (3/89; 3.4%). Allergic CD (13/17; 76.5%) was most frequently reported in violinists and violists. Of 116 violinists and violists, 17 (14.7%) suffered from fiddler's neck. String and plucking instrumentalists most frequently reported callosities (61/89; 68.5%) and skin problems (32/37; 86.5%). Instrument-related skin disorders were significantly associated with high practice frequencies ($P = 0.022$) and a professional status ($P = 0.001$).

Conclusions: Callosities and CD were the most commonly reported skin changes in the respondents. Both callosities and skin problems such as CD and fiddler's neck are significantly associated with high practice frequencies and professional status. Our data indicate that among those returning the questionnaires, string players and plucking instrumentalists seem to be at highest risk of developing skin problems when compared with players of other musical instruments.

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Instrumental musicians are a risk group for a variety of skin conditions, as an intense contact between the instrument and the musicians' skin is usually necessary during music making (1–9). Professional and amateur musicians may suffer not only from common skin diseases of the population at large (e.g. psoriasis and atopic dermatitis) but also from conditions that are a direct result of their work and hobby, respectively. Recently, we have systematically searched the medical and musical literature to identify the dermatological problems of musical instrumentalists (1). A var-

iety of irritant as well as allergic skin conditions have been described previously in numerous brief case observations (1). We found that the most prevalent skin disorders of instrumental musicians, in particular string instrumentalists (e.g. violinists, cellists, and guitarists), woodwind players (e.g. flautists and clarinetists), and brass instrumentalists (e.g. trumpeters), include a variety of contact allergies (e.g. colophonium (colophony), nickel, and exotic woods) and irritant (physico-chemical) skin conditions whose clinical presentation and localization are usually specific for the instrument used (e.g. fiddler's neck). Callosities and 'occupational marks' are very common in instrumental musicians. More or less

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severe skin injuries may rarely occur in musical instrumentalists, in particular acute and chronic wounds including their complications. Skin infections such as herpes labialis seem to be a more common skin problem in woodwind and brass instrumentalists (1). The aim of the present survey was to determine the frequency and risk factors of instrument-related skin disorders in musicians.

Materials and Methods

In 2005, we mailed an 11-item survey to 19 German universities of music and performing arts. The mailing list was mainly collected from the website of the *Rektorenkonferenz der Musikhochschulen in der Bundesrepublik Deutschland* ([http://](http://www.rkmonline.de)

www.rkmonline.de). Altogether, 3120 questionnaires were mailed, which were distributed to the musicians by the local staff at the universities. The entire set of completed questionnaires from each university was mailed back to the Department of Dermatology (Bochum, Germany). Our 1-page self-completed questionnaire, which was a non-standardized and non-validated instrument, included questions relating to age, sex, instruments, history and intensity of musical activity, skin disorders, impact of skin symptoms on music making, etc. (Table 1). We asked about any skin changes directly related or non-related with their instruments. Questions were generally closed in format, but feedback from a pilot study phase enabled us to make the choices as relevant and

Table 1. Anonymous questionnaire for the evaluation of specific skin disorders in instrumental musicians



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Please underline or complete!

Sex: m f Age:.....years Place of residence (City):.....

Principal Instrument (precise name please):.....

Preferred Music Style: Classic Jazz Rock Pop other:.....

You have played this instrument for years:

You play this instrument per week: less than 7 h between 7 and 21 h more than 21 h

You are: Amateur Semi-Professional Professional

You play in a: Symphony-Orchestra Big-Band Rock/Pop Band other:.....

Do you suffer from a skin disease (e.g., atopic dermatitis, psoriasis)? yes no

If so, which one?.....

Has this skin disease been diagnosed by a dermatologist? yes no

Do you experience a deterioration of this skin disease by playing your instrument? yes no

Is playing your instrument affected by this skin disease? no slightly moderately strongly

Do you suffer from a skin disease (e.g., contact allergy) or skin changes (e.g., callosities) which you consider to be caused by playing your instrument? yes no

If so, which one?.....

Has this skin disorder been diagnosed by a dermatologist? yes no

If contact allergy (e.g., nickel) was diagnosed, which allergen was determined by skin testing (patch test)?.....

Does your instrument contain this allergen? yes no

Is playing your instrument impaired by this skin disease and skin changes, respectively? no slightly moderately strongly

appropriately worded as possible. All information was collected anonymously. Musical instruments were categorized in the groups as follows: brass (trumpet, trombone, horn, etc.), woodwind (clarinet, sax, flute, etc.), strings/plucking instruments (violin, viola, guitar, harp, etc.), and miscellaneous (keyboard, percussion, etc.). The statistical software package, Statistical Package for Social Sciences, version 13.0 (SPSS 13.0 for Windows; SPSS, Chicago, IL, USA) was used for data analysis. Basic descriptive statistics were generated and included the means, medians, and frequencies. The contingency data were analysed using the Pearson chi-square statistic. A $P < 0.05$ was determined to be statistically significant.

Results

Of the 3120 questionnaires mailed to the universities, 412 were completed and returned to our department. The number of questionnaires that were actually distributed to the musicians is unknown as unfortunately most universities did not return the non-completed questionnaires. Thus, the most conservative response rate was 13.2% (412/3120). Demographic data of the musicians investigated (respondents) are detailed in Table 2. 82 (19.9%) of the 412 respondents reported that they suffer from a skin disorder that is not related to the instrument. 36 (8.7%) of the 412 respondents suffered from atopic dermatitis and 13 (3.2%) from psoriasis. In most cases (68/82; 82.9%), the skin conditions were previously diagnosed by a dermatologist. 11 (13.4%) of the 82 respondents experienced worsening of their skin condition because of playing their instrument. 62 (75.5%) of the 82 respondents reported that the skin condition did not affect making music. In 17 (20.7%) of the 82 subjects, making music was slightly to moderately affected by the skin condition.

Among the 412 musicians completing the questionnaire, 89 (21.6%) of the 412 reported skin changes that were causally related to their instrument: callosities (52/89; 58.4%), contact dermatitis (CD; 17/89; 19.1%), fiddler's neck (17/89; 19.1%), and erosion (3/89; 3.4%). Callosities were most frequently reported in string, plucking instrument, and brass players (42/52; 80.8%). Most skin changes (73/89; 82%) of the respondents, however, were not previously diagnosed by a dermatologist. Disregarding callosities, 37 (9%) of the 412 respondents reported with instrument-related skin diseases. Of 116 violinists and violists, 17 (14.7%) subjects had fiddler's neck. Allergic CD was most frequently reported in violinists and violists (13/17; 76.5%). In the respondents

Table 2. Demographic and instrument-related data of 412 musicians included in the study

	Frequency (female/male)	Percentage (%)
Sex		
Male	169	41.0
Female	240	58.3
n.d.a.	3	0.7
Age (years)		
11–20	105 (66/37)	25.5
21–30	240 (141/98)	58.3
31–40	35 (19/16)	8.5
>40	32 (14/18)	7.8
Instruments		
Brass	95 (49/45)	23.1
Woodwind	23 (14/9)	5.6
Strings/plucking instruments	183 (115/66)	44.4
Miscellaneous	110 (52/58)	26.7
n.d.a.	1 (0/1)	0.2
Total playing time (years)		
<5	11 (7/4)	2.7
5–10	104 (57/46)	25.2
11–15	132 (77/54)	32.0
16–20	87 (57/30)	21.1
>20	71 (38/33)	17.2
n.d.a.	7 (4/2)	1.7
Playing time per week (hr)		
<7	44 (27/15)	10.7
7–21	175 (100/75)	42.5
>21	189 (111/77)	45.9
n.d.a.	4 (2/2)	1.0

n.d.a., no data available.

with CD, allergy to nickel (11/17; 64.7%), colophonium (1/17; 5.9%), and lanolin (1/17; 5.9%) was confirmed by previous patch testing, respectively. Instrument-related skin alterations slightly to moderately affected music making in 23 (25.8%) of the 89 subjects; only in 2 (2.2%) of the 89 respondents, the effect was severe.

With regard to the total study population, the occurrence of instrument-related skin conditions was not significantly associated with total duration of making music ($P = 0.63$) but with high practice frequencies per week ($P < 0.001$). Instrument-related skin conditions were significantly more frequently reported in professionals ($P = 0.002$) than in semi-professionals and amateurs. The occurrence of instrument-related conditions in the respondents did not depend on musical genre ($P = 0.97$), sex ($P = 0.78$), and age ($P = 0.37$) of the respondents. Subgroup analysis showed that in brass players, neither total duration ($P = 0.89$) of making music nor frequency ($P = 0.066$) of playing per week was associated with the occurrence of instrument-related skin changes. In string players and plucking instrumentalists, however, instrument-related skin problems were significantly associated with higher practice frequencies per week ($P = 0.031$). Excluding callosities from data analysis, we found

that instrument-related skin disorders were significantly associated with high weekly practice frequencies ($P = 0.022$) and a professional status ($P = 0.001$). Regarding string players and plucking instrumentalists investigated, the occurrence of skin disorders besides callosities was also significantly associated with higher practice frequencies ($P = 0.024$). String and plucking instrumentalists most frequently reported callosities (61/89; 68.5%) and skin problems (32/37; 86.5%) when compared with players of other instrument groups (Table 3).

Discussion

The main limitation of the present study is certainly the high risk of selection bias (i.e. possibly, more people with skin problems answered). Thus, the frequencies observed cannot be generalized to musicians in general. Furthermore, the information we collected was self-reported by the musicians, which could lead to recall biases – of course, limitations of all survey studies (10). As we did not use a standardized and validated questionnaire, the sensitivity and specificity of the screening instrument employed remains unknown. Given the lack of epidemiological trials on skin diseases in musicians, however, the present relatively large survey provides useful information on the occurrence of instrument-related skin disorders in musicians.

Previous epidemiological studies among performing artists have failed to consider skin disorders (2, 3). However, in a small survey on 24 symphony orchestra members, mechanically caused skin conditions were the most frequent findings that were directly associated with the instrumental performance (6). Nethercott and Holmes confirmed these results in their survey on 41 orchestra players (5). Furthermore, Önder et al. (9) surveyed 97 orchestra musicians; 3 of them had allergic CD related to their instrument. In the present study, the frequencies of skin conditions such as atopic dermatitis (8.7%) and psoriasis (3.2%), which were not related to the musical

instrument, appear to be in accordance with the expected incidence rates of these conditions in adult Germans (11, 12). Interestingly, playing the instrument more frequently worsened the skin condition than vice versa. In a recent survey on 117 musicians working in a professional orchestra, a significant incidence of occupational and stress-related skin problems such as psoriasis and atopic dermatitis has been reported (9). It is well known that performing artists, in particular instrumental soloists, are exposed to enormous psychological stress (2, 3). Thus, emotional factors may significantly trigger common idiopathic or genetically predisposed skin disorders in the musicians as well.

There are numerous case observations of allergic CD to unmodified colophonium in instrumental musicians, in particular string players such as violinists and cellists (13, 14). In the present survey, 1 violinist reported colophonium allergy that was previously confirmed by patch testing. Colophonium dust may cause dermatitis of the fingers and hands as well as of the face and neck. Unmodified colophonium is commonly used by string players to wax the strings in order to increase the attrition between the bow and the strings. Nickel, a common metal, is the most frequent contact sensitizer in the population at large. Frequency estimates for the German adult population based on the findings of Schafer et al. (15) were 9.9% for nickel (15, 16). Nickel CD has previously been reported in string players (e.g. violinists, cellists, and guitarists) and wind and brass instrumentalists such as flautists and trumpet players (1). Our data seem to indicate that the frequency of nickel sensitivity in the musicians, who returned the questionnaire, appears to be considerably lower than the normally expected nickel allergy rates reported in the general population (15, 16). However, we must emphasize that patch testing was likely not performed in all respondents.

Peachey and Matthews (17) systematically studied fiddler's neck that frequently affects violin and viola players. An area of lichenification and

Table 3. The frequency of instrument-related skin changes in 89 musicians depending on musical instrument groups

Instruments	Callosities (female/male)	Contact dermatitis (female/male)	Fiddler's neck (female/male)	Erosion (female/male)	Total (%) (female/male)
Brass (female/male)	13 (6/7)	3 (1/2)	0	1 (1/0)	17 (19.1%) (8/9)
Woodwind (female/male)	3 (2/1)	0	0	0	3 (3.4%) (2/1)
Strings/plucking instruments (female/male)	29 (16/13)	13 (12/1)	17 (13/4)	2 (1/1)	61 (68.5%) (42/19)
Miscellaneous (female/male)	6 (1/5)	1 (1/0)	0	0	7 (7.9%) (2/5)
n.d.a. (female/male)	1 (0/1)	0	0	0	1 (1.1%) (0/1)
Total (%) (female/male)	52 (58.4%) (25/27)	17 (19.1%) (14/3)	17 (19.1%) (13/4)	3 (3.4%) (2/1)	89 (100%) (54/35)

hyperpigmentation on the side of the neck below the angle of the jaw is usually reported in this skin disorder. Erythema, scaling, cyst and scar formation, papules and pustules, and even focal neck oedema may occur as well. Probably because of the particular location and relatively complex mechanism for causation of fiddler's neck, the clinical appearance and histopathology of this skin condition show a wider spectrum of skin changes compared with common irritant CD (1, 17, 18). In the present study, almost 15% of violinists and violists suffered from fiddler's neck. By contrast, Rimmer and Spielvogel (6) reported fiddler's neck in all violinists ($n = 6$) and violists ($n = 3$) of a professional orchestra.

A welcome skin condition experienced by almost all musicians at both amateur and professional levels is the development of callosities on sites where the skin is repetitively irritated because of intense contact to certain parts of the instrument such as the strings of a guitar (1–9). Callosities of musicians should only be considered pathological if they are excessive and symptomatic. Excessive rhagadiform hyperkeratoses may occur in predisposed individuals, in particular in instrumentalists with psoriatic or atopic diathesis. Frequently, beginning string instrumentalists, who have not yet developed sufficient callosities, are plagued by eternally sore fingertips and traumatic blister formation. In the present survey, callosities were the most commonly reported skin changes (52/89; 58.4%). Erosions were reported only in 3 cases, indicating that the vast majority of respondents surveyed were advanced players.

Baccouche et al. (19) recently reported a large study on 594 music students in Tunisia. 295 students (49.7%) had at least one dermatological lesion. In multivariate analysis, the following factors were significantly correlated with dermatological problems: male, age ≥ 20 years, history of musical activity ≥ 5 years, practice > 10 hours per week, and percussion instruments. 9 types of lesions were determined: corns and calluses, pigmentation abnormalities, irritant CD, mechanical acne, erythema, friction bulla, nail diseases, cicatricial alopecia, and allergic CD. Corns and calluses were significantly the most frequent. The frequency of dermatological lesions was high (49.7%) compared with the present results (21.6%) and the data reported in the literature, 20% and 32%, respectively, in the studies by Önder et al. (9) and Rimmer and Spielvogel (6). This difference could be because of the much greater number of percussionists in the study of Baccouche et al. (19).

In conclusion, because of considerable selection and recall bias, the present data cannot be seen as

representative for musicians in general. Callosities were the most commonly reported skin changes in the respondents. The latter relatively frequently also suffered from bothersome skin problems such as CD. Both callosities and skin problems such as CD and fiddler's neck were significantly associated with high practice frequencies and professional status. Our data indicate that among those returning the questionnaires, string players and plucking instrumentalists seem to be at highest risk of developing skin problems when compared with players of other musical instruments.

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