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Examining the prevalence of allergic diseases in hairdressers in the Black Sea region

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Abstract

In the present study, the prevalence of allergic diseases among occupational diseases in hairdressers was examined in Samsun Province, which is located in the Black Sea Region. The purpose was to determine whether hairdresser employees use adequate protective equipment, and to increase the training levels of hairdressers in this respect. The Study Group consisted of hairdressers working in the Black Sea Region. A total of 700 hairdressers were included in the study. The data were prepared to determine working conditions, occupational and environmental allergic diseases. The ISAAC Questionnaire Form was modified according to our Study Group. The data obtained were analyzed in computer medium by using the IBM SPSS V23 Package Program. The Mann Whitney U and McNemar Tests were used in the evaluation of the data. It was determined that 310 of the hairdressers who participated in the study worked in female hairdressers, and 390 worked in male hairdressers. It was determined that 97.4% of the female hairdressers who worked in female hairdressers and who participated in the study used protective equipment, 33.5% of them had respiratory complaints before professional life, 9.4% had itching on the skin; 54.5% of them had respiratory complaints after their professional life, and 28.4% had skin itching. A total of 44.2% had an allergic reaction to hair dye, and 42.9% to decolorizer. A total of 25.5% of had obstruction, and 24.2% had cough as allergic reactions. It was determined that 31.6% of those who did not have respiratory complaints before professional life had respiratory complaints after their professional lives. In male hairdressers who participated in the study, it was determined that 63.8% of them used protective equipment, 11.3% had respiratory complaints before professional life, and 31.0% had respiratory complaints after professional life. It was also determined that 30.0% had allergic reactions to hair spray, and 26.2% had allergic reaction to perfume. It was determined that 23.3% had allergic reactions as sneezing and 20.5% obstruction. In the present study, the relation between the allergic diseases of hairdressers and their professions was examined. It was determined that the hairdressing profession increases allergic diseases.

Keywords: asthma, allergic diseases, hairdressers, occupational disease

1. Introduction

Those who work in hairdresser salons face the negative effects of various chemicals and mechanical practices at work periodically. The products used is these salons (hair dye, hair spray, permanent oils, decolorization agents, shampoo, etc.), and workplace conditions (dust, smoke, steam, cigarette smoke, etc.) cause occupational diseases especially for inexperienced employees with both allergen and irritable effects (1, 2). It was reported in previous studies that the most common disease faced because of occupational hazards employees are exposed to in hairdressing profession is occupational asthma. The UK Health and Safety Agency reported in 2005 that hairdressers had the highest frequency of occupational skin disease (3). It was stated by professionals in this field that very few of the hairdresser employees had asthma before starting the profession; however, 40% were receiving asthma and eczema treatment at the time of the study (4). Esin et al. (5) reported that young people working in hairdressers between the ages of 15-21 in our country had more skin and respiratory system complaints than other occupational employees of similar age.

In planning healthcare for employees, it is necessary that the existing problems of the employees are determined first. It is possible to argue that that studies on health problems and related factors are inadequate in terms of occupational diseases especially in risky professions. For this reason, this study was planned to determine the risks and factors that affect occupational asthma in people in hairdressing profession.

2. Material and Methods

This study aimed at examining the prevalence of allergic diseases of male and female hairdressers in the Black Sea Region. The study was conducted between 20.02.2016 and 20.05.2016 with the participation of the hairdressers who were willing and voluntary to participate in the study. The ISAAC Questionnaire Form was modified according to our Study Group. The Questionnaire Form was pre-applied in a 10-person hairdresser salon group, determining and correcting the questions that were incomprehensible or missing. After the pilot study, the final form was applied to the Study Group. The data were collected with face-to-face interview with the hairdressers by the researcher. The hairdressers who

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participated in the study were informed about the study, their informed consents were obtained, and questions were asked about the introductory information form and professional diseases.

According to previous questionnaire studies, power analysis was made, and the sample size calculated for 14.6% allergy difference, 80% test power, 95% Confidence Interval was determined to be 680 people. The Kolmogorov-Smirnov, Shapiro Wilk, Mann Whitney U, Chi-Square, and McNemar Test were used in the analyses of the data. The reliability of the data was examined with the Cronbach Alpha Coefficient. The significance level was taken as $p<0.05$. The study was started after the approval of the Ethics Committee of the Faculty of Medicine at the University of Ondokuz Mayıs (19.11.2015/issue; B.30.2.ODM.020.08/2137). Informed consents of the people who were included in the study were also obtained.

The questions that were modified from the ISAAC Test given in Table 1 were asked to the patients.

Table 1. The ISAAC Questionnaire Form was modified according to our Study Group.

1. How many years have you been a hairdresser?
a) 1-5 b) 6-10 c) 11-15 d) 16-20 e) more than 20 years

2. Do you find the ventilation in your workplace sufficient?
a) Yes b) No

3. Do you use protective equipment while working?
a) Yes b) No

4. Which equipment do you use while working? (you may choose more than one)
a) Gloves b) Mask c) Glasses d) Apron e) Other:

5. Did you have any complaints about breathing before your professional life?
a) Yes b)No

6. Which respiratory complaints did you have?
a) Cough b)Shortness of breath
c) Wheezing d) Chest pain

7. Did you have any complaints about breathing after your professional life?
a) Yes b)No

8. Which complaints did you have after you started hairdresser profession?
a) Cough b)Shortness of breath
c) Wheezing d) Chest pain

9. Were you diagnosed with **allergic bronchitis or asthma** by your doctor?
a) Yes b) N o

10. Did you have nasal flow, nasal obstruction, sneezing, itchiness in the nose, postnasal drip complaints before you started your professional life?
a) Yes b) No

11. Did you have nasal flow, nasal obstruction, sneezing, itchiness in the nose, postnasal drip complaints after you started your professional life?
a) Yes b) No

12. Were you diagnosed with **allergic rhinitis or allergic seasonal rhinitis** by your doctor?
a) Yes b) No

13. Did you have redness, watering, burning sense in your eyes before you started job as a hairdresser?
a) Yes b) No

14. Did you have redness, watering, burning sense in your eyes after you started job as a hairdresser?
a) Yes b) No

15. Were you diagnosed with **allergic** conjunctivitis **or eye flu** by your doctor?
a) Yes b) No

16. Did you have **itching, rash, redness** in your skin before you started your professional life?
a) Yes b) No

17. Did you have **itching, rash, redness** in your skin after you started your professional life?
a) Yes b) No

18. Were you diagnosed with **eczema (itchy rashes)** by your doctor?
a) Yes b) No

19. Where did you have **eczema (itchy rashes)** in your body?
The place of the eczema:

20. Do you have an allergic medication you use constantly?
a) Yes b) No

21. Does your parents have asthma, allergic rhinitis, eczema, allergic conjunctivitis? Please specify?

3. Results

The questionnaires were applied to 700 hairdressers in the scope of the study. A total of 233 of the hairdressers who participated in the study were women, and 467 were men. There were a total of 390 male hairdressers, and had a mean age of 34.2±8.7. The number of the female hairdressers was 310, and 75.2% of them were female (n:233), and 24.8% (n:77) were male. The mean age of the groups was 30.8±8.4.

A total of 82.9% of the female hairdressers found the ventilation of their workplace as sufficient, and 97.4% used protective equipment. A total of 92.3% of the hairdressers who used protective equipment used gloves, 38.7% used masks, 5.2% used glasses, and 71.9% worked with aprons. A total of 84.1% of the male hairdressers found workplace ventilation sufficient, and 63.8% used protective equipment. A total of 57.9% of the hairdressers who used protective equipment used aprons, 25.6% used gloves, 1% used masks, and none of them used protective glasses. It was determined that those who used protective equipment had lower asthma risks.

According to Table 2, 33.5% of the participants had complaints about breathing, 20.3% had cough, 17.4% had shortness of breath, 3.5% wheezing, and none had chest pain. When the condition of female hairdressers after their professional life was evaluated, it was determined that 54.5% complained about breathing, 37.4% had cough, 35.5% had shortness of breath, 13.9% had wheezing, and 4.5% had chest pain. The diagnosis of allergic asthma and bronchitis was 31.3%.

Before their professional life, although 25.2% of the female hairdressers had complaints about nasal flow and sneezing, after professional life, the rate of having nasal flow and sneezing complaint was 45.5%. The allergic rhinitis diagnosed by doctor was 22.9%. Before their professional life, although female hairdressers had itching and redness complaints in the

eyes was 20.0%, after the professional life, the itching and redness complaints in the eyes was 49.4%. Doctor-diagnosed allergic conjunctivitis rate was 20.0%.

Table 2. Evaluation of allergic diseases of the employees working in women hairdressers before and after their professional lives

Working in Women Hairdressers (n:310)	Before professional life	After professional life	p
Complaints about breathing	33.5%	54.5%	p<0.01
Cough	20.3%	37.4%	p<0.01
Shortness of breath	17.4%	35.5%	p<0.01
Wheezing	3.5%	13.9%	p<0.01
Chest pain	0%	4.5%	p<0.01
Nasal flow, sneezing	25.2%	45.5%	p<0.01
Itchiness in the eyes, rash	20%	49.4%	p<0.01
Itchiness in the skin, rash	9.4%	28.4%	p<0.01

McNemar Test

The rate of female hairdressers having itching and redness complaint in the skin before their professional life was 9.4%. After professional life, the complaint of itching and redness in the skin was 28.4%. The number of people diagnosed with eczema by doctor was 14.8%. Eczema was seen at 11.9% in the hands, 3.5% in the arms, 3.5% in the feet, 2.3% in the scalp, and 0.6% in the face.

According to Table 3, 11.3% of the male hairdressers had respiratory complaints, 9.7% had cough, 4.9% had shortness of breath, 2.1% had wheezing, and none had chest pain. When their conditions after professional life were evaluated, it was determined that 31.0% had breathing complaints, 26.7% had cough, 15.1% had shortness of breath, 5.9% had wheezing, and 2.1% had chest pain. Doctor-diagnosed allergic asthma and bronchitis diagnosis rate was 12.3%.

The incidence of nasal flow and sneezing complaints before professional life in those who worked in male hairdressers was 9.7%, and the incidence of nasal flow and sneezing complaints after professional life was 37.9% in male hairdressers. Doctor-diagnosed allergic rhinitis rate was 13.6%. Before professional life, the rate of itching and redness in the eyes was 1.3%, and after professional life, the rate of itching and redness in the eyes was 18.5%. Doctor-diagnosed allergic conjunctivitis rate was 2.6%. Before professional life, the complaint of itching and redness on the skin was 1.0%. After professional life, the complaint of itching and redness on the skin was 10.3%. The number of people who were diagnosed with eczema by doctor was 3.1%. When examined in terms of the place where eczema was detected, it was detected 2.8% in the feet, 2.6% in the hands, 1.8% in the arms, 1.8% in the face, and 0.5% in the scalp. A statistically significant difference was detected in terms of allergic diseases before and after the professional life.

Table 3. Evaluation of the allergic diseases of the employees working in men's hairdressers before and after the profession

Working in Women Hairdressers (n: 390)	Before professional life	After professional life	p
Complaints about breathing	%11,3	%31	p<0,01
Cough	%9,7	%26,7	p<0,01
Shortness of breath	%4,9	%15,1	p<0,01
Wheezing	%2,1	%5,9	p<0,01
Chest pain	%0,5	%2,1	p<0,01
Nasal flow, sneezing	%9,7	%37,9	p<0,01
Itchiness in the eyes, rash	%1,3	%18,5	p<0,01
Itchiness in the skin, rash	%1	%10,3	p<0,01

McNemar Test

When the allergic reactions of the hairdressers were examined for the last 12 months, it was determined that 51.0% of female hairdressers had watering in the eyes, 41.6% of them had itching in the nose, nasal flow, obstruction, 33.9% had complaints of waking up with cough attacks, 27.1% had redness in the skin and itching, 26.8% of them had complaints of waking up with shortness of breath, 25.2% had wheezing. A total of 36.9% of the male hairdressers had itching, nasal flow and obstruction in the nose, 18.2% had watering in the eyes, 10.5% had wheezing, 8.7% had itching and redness on the skin, and 8.5% had complaints of waking up with shortness of breath. When smoking rates were examined, it was determined that 65.8% of the female hairdresser smoked, and 40.5% of the male hairdressers smokes.

Although the female hairdressers used 23.9% allergy medication, male hairdressers used allergy medication at a rate of 11.5%. It was determined that the most frequently used medication was inhaler steroid at a rate of 27.7% in female hairdressers, and at a rate of 11.5% in male hairdressers.

4. Discussion

The present study was conducted to evaluate the risk of occupational asthma in hairdressers in the Black Sea Region in northern Turkey. Although the daily usage of cosmetics containing chemicals is quite high today, it was also determined that employees did not use precautions to reduce their exposure to these chemicals. The risk of occupational asthma increases because of lack of good ventilation conditions in workplaces, and the lack of adequate use of protective equipment. In the study that was conducted by Soy (6) to evaluate the ergonomic suitability of female hairdresser salons by employees, it was determined that 60.6% of the female employees at female hairdressers and 75.0% of the male

employees at female hairdresser salons found that the ventilation in the workplace was sufficient, which supports the research findings. When personal protective equipment usage rates at work were examined, it was determined that 76.7% of the female employees, and 83.3% of the male employees used protective equipment. In our study, on the other hand, it was determined that female hairdressers used protective equipment at a rate of 97.4%, and male hairdressers used protective equipment at a rate of 63.8%. It is considered that the use of protective equipment will reduce the rate of exposure to chemicals and the risk of occupational asthma allergies may decrease by improving ventilation systems.

It was determined that hairdressers did not pay adequate attention to the use of protective clothing and gloves, which are extremely important in terms of protection of the skin and exposure to chemicals. The rate of apron use was 64%, wearing gloves was 55%, wearing masks was 17%, and wearing glasses was 2%. Mandıracıoğlu et al. (7) determined that 41.2% of the participants wore gloves in each task at work, and 15.2% used protective wear. In the study of Gül et al. (8), the rate of using gloves was determined to be 72.5%. Chemicals that have allergic and irritant effects often cause health problems like respiratory tract reactions, asthma, dermatitis, rhinitis, and ocular diseases in barbers. The use of protective equipment for hairdressers and barbers, where atopic dermatitis, allergic rhinitis, and conjunctivitis are seen commonly, are very important in this respect.

Cosmetic products like shampoos, creams, hair dyes, sprays and conditioners that have hundreds of chemicals are used in barber shops and hair salons. The substances female hairdressers reacted at the highest rate was hair dye with 44.2%, decolorization agent, and the nail polish odor had the lowest rate as 2.6%. In male hairdressers, hair spray had the highest reaction at a rate of 30.0%, perfume at a rate of 26.2%, hair dye at a rate of 23.3%, and perm medication had the lowest reaction at a rate of 3.1%. Higher eczema rates in female hair dressers were associated with being exposed to more chemicals.

Compared to those who have asthma, it is difficult for hairdressers who have eczema to continue their professions regularly. It causes early leave of work because of constant hand washing during the day and exposure to various chemicals. It was reported that the risk of leaving work because of an allergic disease was more than 20% in hairdressers (11). Studies show that the frequency of eczema decreases, while asthma increases with furthering age (1). Hairdressers who suffer from respiratory symptoms continue their work despite findings like nasal obstruction, sneezing, wheezing and shortness of breath. It was determined that as the number of years spent at work increased, so did the prevalence of allergic reactions. More respiratory symptoms, prolonged encounter with chemicals and inadequate ventilation were associated with the increasing age and years spent at work. In the study that was conducted by Akpınar et al., it was determined that the frequency of occupational asthma was 3.6 times higher in those who had more contact with chemicals because of the intensity of work.

However, it was observed that there are more occupational asthma and allergic diseases in people who had atopy history in their families.

Holland et al. (1) conducted a study with hairdressers, and reported that the prevalence of respiratory symptoms suggesting asthma was 45%. Mandıracıoğlu et al. (7) conducted a study in Izmir province to determine the occupational health risks of barbers and hairdressers, and reported that 35% of hairdressers had allergic complaints. When the complaints of the female hairdressers participating in this study related to allergic diseases before and after their professional life were evaluated, it was determined that 33.5% complained about respiratory functions before their professional life, and 54.5% complained about respiratory functions after their professional life. The rate of the complaints of the male hairdressers was 11.5% before their professional lives, and after their professional lives, this rate was 31%.

In the study conducted by Hollund et al. it was determined that 71% had nasal flow, 41% shortness of breath, 39% watering in the eyes, 37% wheezing, 34% cough complaints lasting more than two weeks, and 34% had eczema. In our study, on the other hand, 51.0 of the female hairdressers had watering the eyes, 41.6% had itching, nasal flow, and obstruction in the nose, 33.9% had the complaint of waking up with a cough attack, 27.1% had redness and itching in the skin, 26.8% had the complaint of waking up with shortness of breath, 25.2% had wheezing. In 36.9% of the male hairdressers, the complaints were itching, nasal flow, and obstruction; watering in the eyes was at a rate of 18.2%, wheezing at a rate of 10.5%, itching and redness on the skin at a rate of 8.7%, shortness of breath at a rate of 8.5%.

In our study, 20% of the patients had doctor-diagnosed asthma, 17% had rhinitis, 10% had conjunctivitis, and 8% had eczema. In a previous study conducted by Akpınar et al. in our country, asthma rate was 14.6%. Today, it is considered that the use of more chemicals increased these rates.

In the study conducted by Gül et al. (8) to Determine the Health Problems of Employees in Hair Salons, 21.1% of the hairdressers were diagnosed with allergy, 61% were diagnosed with asthma, and 14.0% were diagnosed with skin disease by the doctor. It was determined that 18.7% of the participants had skin rash in their bodies. In the study that was conducted by Çelenk (9) on the basic qualities and problems faced in workplaces of hairdressers department students in Ordu Vocational Training Center, it was determined that 11.3% had skin diseases, and 11.9% had respiratory diseases. Içbay (10) conducted a study to determine the physical conditions of

female hairdressers in the city center of Gaziantep and to evaluate the health-related complaints and practices of the employees due to infectious diseases, it was determined that 25.9% of employees had respiratory tract problems, 52.4% had allergic complaints, and 32.6% complained about their skins.

In the light of the findings obtained in the study, it is recommended that initiatives are planned to pay more attention to the use of protective equipment for hairdressers, it is ensured that hairdressers are aware of occupational diseases, and trainings are organized on the measures that can be taken, working conditions are regulated and improved. It is necessary that the workplace environment is safe, ventilation is improved, chemicals used are inspected, protective equipment are used appropriately, and legal sanctions are imposed in this respect.

Conflict of interest

None of the authors has any potential financial conflict of interest related to this manuscript.

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Authors' contributions

Concept: N.K, R.S, Ş.İ.K.K., Design: N.K, R.S, Data Collection or Processing: N.K, R.S, Ş.İ.K.K., G.H, Analysis or Interpretation: N.K, R.S, Ş.İ.K.K, Literature Search: N.K, Ş.İ.K.K, G.H , Writing: N.K, Ş.İ.K.K

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