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Olfactory Dysfunctions – Patients' Perception

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ABSTRACT

Objective: The study aimed to assess patients' perception of their own impaired sense of smell. The findings were compared with 2 standardized olfactometry tests.

Materials & Methods: A total of 134 subjects (59 men and 75 women) aged 53 years on average were tested: 58 subjects with sinonasal disease (aged 50 on average), 21 subjects with a post-traumatic olfactory dysfunction (aged 39 on average), 19 subjects with a post-viral olfactory dysfunction (aged 58 on average), and 36 subjects with another etiology of the olfactory dysfunction (aged 54 on average). A questionnaire was used to survey the subjective evaluation of the severity of olfactory dysfunctions and its perception in everyday life. Odor sensitivity was examined using the Odorized Markers Test (OMT) and "Sniffin' Sticks" (a 16-item identification test).

Results: All 134 persons included in the study reported difficulties with smell. While 42% of the subjects felt severely impaired, 43% felt slightly disadvantaged, and 15% did not feel impaired at all. The olfactory dysfunction affected the everyday life of 62% of the respondents.

Conclusion: Women suffered from olfactory dysfunctions more than men. No relationship between the perception of the severity of the olfactory dysfunction and the impact on quality of life was identified. The output of the study will be used to develop a questionnaire assessing the quality of life of patients with olfactory dysfunction.

KEY WORDS

Olfaction, Smell Disorders, Quality of Life, Subjective Olfactometry, Questionnaire

INTRODUCTION

Olfactory dysfunction can have a major impact on the individual's mental condition and social communication. The rapid onset of olfactory dysfunction and poor prognosis amplify the negative perception of the problem. Patients' common response includes feelings of isolation, nutritional problems due to the inability to detect a pleasant scent of food, and emotional numbness (Toller, 1999, p 705). Today, assessment of quality of life is part of the algorithms that are used to evaluate the severity of the disease and effectiveness of treatment or to compare various treatment modalities. A number of diagnostic procedures evaluate the severity of the disease, but the findings do not always correlate with quality of life as perceived by the patient.

The most common causes of olfactory dysfunctions include sinonasal diseases, post-head-trauma conditions, and post-viral olfactory disorders.

The Czech version of the questionnaire SNOT-22 (The Sino Nasal Outcome Test), which is used to assess sinonasal diseases, contains one question evaluating the loss of smell and taste, which can thus be considered an important indicator of the quality of life. Patients evaluate problems on a six-point scale (0 – no problems, 5 – the most severe problem possible) (Schalek, 2010, p 149).

The quality of life of patients with post-viral and sinonasal olfactory disorders were assessed by Toledano et al. (2011, p 505), using the QOL (Quality of Life) questionnaire and the Rhinosinusitis Disability Index. The questionnaire contained 30 questions from 3 areas: physical, practical and emotional. For each question patients had a choice of answers: never (0), almost never (1), sometimes (2), almost always (3) and always (4). Two questions regarding the smell were included. They also evaluated the overall severity of the sinonasal disease using a scale of 1 (mild symptoms) to 10 (severest symptoms).

Studies often assess the severity of rhinosinusitis and nasal polyposis on the grounds of a subjective impression using a visual analogue scale (VAS), where patients evaluate the severity of their problems with

numbers 0 to 10 (VAS 0 = no problems, 10 = worst possible problems) (Pniak et al., 2010, p 549).

Frasnelli, Hummel (2005, pp. 231–232) compared the quality of life of people suffering from parosmia (olfaction that arises in the presence of an odour; patients usually report that all substances smell similarly, very often unpleasantly) and quantitative olfactory dysfunction (hyposmia and anosmia). They used the newly developed Questionnaire of Olfactory Disorders (QOD), which consists of 52 items that are divided into 3 areas – negative statements, positive statements, and socially desirable statements, which should enhance the credibility of answers. The questionnaire is designed for individuals with impaired sense of smell, and its shortened version was also used in the study by Simopoulos et al. (2012, p 1,450).

As the impact of olfactory dysfunction on everyday life has not been completely researched yet, we decided to assess perceived problems with smell in relation to quality of life and olfactometry.

OBJECTIVE

To assess patients' perception of their own impaired sense of smell in relation to quality of life. To compare the severity of perceived olfactory dysfunction with the findings of standardized olfactometry tests – Odorized Markers Test (OMT) and "Sniffin' Sticks" (a 16-item identification test).

PARTICIPANTS AND METHODS

The survey was carried out from January 2011 to May 2012 at the Department of Otorhinolaryngology and Head and Neck Surgery, Pardubice Regional Hospital. A total of 134 persons (59 men and 75 women) who reported perception of impaired smell in the survey participated in the study. At the same time, 68 people reported problems with taste (food tastes different) and 19 people stated to be unable to identify the four basic tastes (bitter, salty, sweet, sour). The study included 58 people with sinonasal disorder. Their average age was 50 years (± 15).

Twenty-one participants suffered from post-trauma olfactory dysfunction and their average age was 39 years (± 13). While 19 persons of average age 58 years (± 13) were diagnosed with post-viral olfactory disorder, 36 subjects had a different etiology of olfactory dysfunction, and their average age was 54 years (± 19). The subjects were verbally notified about the course of the study. Participation was conditioned by signing informed consent. The research was approved by the Ethical Committee of the Pardubice Regional Hospital. Prior to examination, basic data about the participants (age, sex, occupation, contact with chemicals, smoking, disease, injuries to the head and neck) were collected. The testing also focused on subjective assessment of smell, nasal patency, taste sensations, and perception of difficulties in everyday life (see Fig. 1). The questionnaire was developed at the Department of Otorhinolaryngology and Head and Neck Surgery, Pardubice Regional Hospital (Vodička et al., 2007, p 165). This was followed by examination of the orthonasal olfaction using the Odorized Markers Test (Vodička et al., 2007, p 165) and Sniffin' Sticks – a 16-item identification test (Hummel et al., 1997, p 42), which has been validated for the Czech population (Vodička et al., 2011, p 123). Maximum OMT score was 12 points. Five or fewer points indicate possible anosmia and 6 to 8 points hyposmia. Regarding the 16-item identification test Sniffin' Sticks, normal values in the Czech population are 11 points for women and 10 or more points for men. The procedure for olfaction testing has been published (Racková et al., 2009, pp. 58–61).

Data processing involved using descriptive statistics (composition of the research group, subjective evaluation of olfaction, the results of olfactometry tests) in MS Office Excel 2007, Microsoft Corporation. The correlation of the tests and subjective evaluation of smell is assessed with Pearson correlation coefficients as the linear relation.

RESULTS

A total of 134 persons who subjectively reported impaired olfaction were included in the study. Subsequently however, 9 people described their sense of smell as normal (mean VAS = 7.7). On the other hand, 76 people put their sense of smell at impaired (mean VAS = 4.6) and 49 people answered "I cannot smell anything" (mean VAS = 0.7). Nasal patency was rated as normal by 82 persons (mean VAS = 8.4). Impaired nasal patency was reported by 47 persons (mean VAS = 4.7), while 5 persons suffered from complete nasal congestion (mean VAS = 1.8). The correlation (a measure of dependence of two variables) of subjective assessment of olfaction (VAS 0–10) and nasal patency (VAS 0–10) was 0.03.

On average the whole group scored 5.6 points (median – 6 points) in the olfactometry test OMT and 7.3 points (median – 7 points) in Sniffin' Sticks (16-item identification test).

The correlation coefficient measures correlation between the subjective evaluation of olfaction on the visual analogue scale (VAS 0–10) and the results of olfactory tests, and the relationship between the individual olfactory tests in all the participants (see Table 1). The test results show a positive correlation, which means that the participants had similar scores in both the tests. The subjective evaluation of olfaction correlates with the results of the olfactory tests.

Do you have problems: **with smell** ☐ yes ☐ no

food tastes different ☐ yes ☐ no

with taste – cannot tell if it is salty, sweet, bitter, sour ☐ yes ☐ no

Complete if you have problems with smell and/or taste:

How long have you had the problems? ☐ about a week (1) ☐ about a month (2) ☐ 1–2 years (3) ☐ many years (4) ☐ from birth (5)

Has the sense of smell and/or taste been changing? ☐ it has been improving (1) ☐ no change (2) ☐ has been deteriorating (3) ☐ varies (4)

How troubling is the smell and/or taste disorder/s? ☐ very (1) ☐ mildly (2) ☐ not at all (3)

How often are aware of the difficulties? ☐ every day (1) ☐ once a week (2) ☐ rarely (3) ☐ never (4)

How would you rate your sense of smell: ☐ normal ☐ impaired ☐ I can smell nothing

0,____1,____2,____3,____4,____5,____6,____7,____8,____9,____,10 (rate your sense of smell)

worst best

How do you rate nasal patency: ☐ normal ☐ impaired ☐ nose is impassable

0,____1,____2,____3,____4,____5,____6,____7,____8,____9,____,10 (rate the nasal patency)

completely closed completely open

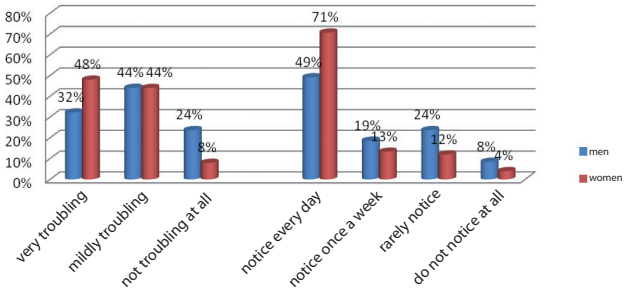
Fig. 1 Questions evaluating the perception of smell impairment in daily life

Table 1 Correlation coefficient between the subjective evaluation of olfaction (VAS 0–10) and the results of olfactory tests

	OMT	Sniffin' Sticks	VAS 0–10
OMT	1.00		
Sniffin' Sticks	0.67	1.00	
VAS 0–10	0.62	0.51	1.00

Table 2 shows the assessment of perceived difficulties in the everyday life of people with impaired sense of smell (see Table 2).

The image (see Figure 1) evaluates the perception of the quality of life of people with impaired sense of smell in relation to gender.



Graph 1 Perception of the quality of life of people with impaired sense of smell in relation to gender

Over half of the participants, 69 (51%), saw their olfaction at VAS 0 to 3. Their smell disorder is a severe

Table 2 Perceived problems with smell in everyday life

duration of problems with smell	about a week	about a month	up to 1 to 2 years	many years	from birth
	1%	10%	44%	43%	1%
the sense of smell changes over time		improving	no change	deteriorating	varies
		15%	52%	8%	25%
discomfort felt due to olfactory dysfunction			significant	mild	not at all
			42%	43%	15%
awareness of the olfactory dysfunction		every day	once a week	rarely	not at all
		62%	15%	17%	6%

nuisance for 55% of the participants, a mild one for 32%, and 13% report no difficulties. Fifty-seven (43%) persons subjectively rated their smell as VAS 4 to 7. Their smell disorder is a severe nuisance for 26% of the participants, a mild one for 58%, and 16% report no difficulties. Eight (6%) persons subjectively rated their smell as VAS 8 to 10. Their disorder is a severe nuisance for 38% of the participants, a mild one for 37%, and 25% report no difficulties. Correlation (a measure of dependence of two variables) between the subjective assessment of olfaction at VAS (0–10) and the perception of difficulties (level of inconvenience) was 0.20.

DISCUSSION

The professional community operates with the validated SNOT-22 questionnaire that assesses the quality of life of persons with chronic rhinosinusitis. Sinonasal olfactory dysfunctions are common and considered as important indicators of quality of life (Schalek, 2010, p 149). Chronic rhinosinusitis, however, has a number of other symptoms that affect the results of the questionnaire. Impaired nasal patency has a major impact on reduced quality of life associated with olfactory loss due to sinonasal disease. The severity of the sinonasal disease can also be assessed using the visual analogue scale VAS 0 to 10 (0 = mild symptoms, 10 = worst possible symptoms).

VAS > 5 always means impaired quality of life (Pniak, 2010, p 549). The research group included 52 patients with chronic rhinosinusitis. Perception of olfactory dysfunction scored the average of 3.5 on the visual analogue scale (VAS 0–10). The subjective evaluation of nasal patency was 5.8 on average on the same visual analogue scale. In subjective assessment of nasal patency and olfaction, healthy individuals tend to confuse one another. The results of olfactory tests correlate better with the subjective evaluation of nasal patency than the subjective evaluation of smell. After testing subjective olfactometry, the situation is reverse: the participants are now able to estimate their sense of smell (Vodička, Faitlová, 2012, p 38).

The results in the research group indicate that olfactory dysfunction troubles women more than men, which is consistent with other studies. In women, olfactory dysfunction leads to more complaints compared to men. It may also indicate that the sense of smell is more important for women (Frasnelli, Hummel, 2005, p 234). Women also achieved significantly higher scores in the questionnaire (QOD, QOD-NS, BDI, Zung) in the study by Simopoulos et al. (2012, p 1453).

Parosmia is more likely to lead to light depression compared with quantitative disorders of smell (Frasnelli, Hummel, 2005, p 234). It is typical for olfactory dysfunctions after upper respiratory tract infections. Persons with parosmia score lower in olfactory testing (Vodička, Faitlová, 2012, p 57). The study included 19 people with postviral olfactory dysfunction. These were not investigated for simultaneous occurrence of parosmia. Neither did the study investigate the relationship between the perception of the severity of the olfactory dysfunction and the impact on quality of life.

A number of studies abroad have focused on quality of life. Problems encountered in everyday life include problems with cooking, mood swings, reduced appetite, inadequate perception of one's own body odour, consumption of spoilt food, fear of gas leak or smoke.

Odorants penetrate to the olfactory cells from the air through nostrils (orthonasal olfaction) and from the oral cavity via the nasopharynx (retronasal olfaction). Many patients with an impaired sense of smell complain of taste disorders. However, the loss of taste is measurable only in less than 5% of the cases. Generally, anosmia is accompanied by a moderate reduction in taste sensations (Hummel et al., 2011, pp. 1–3). In our questionnaire, the subjective assessment of the difficulties combined both the sense of smell and taste. Perception of taste disorder is bound to affect the assessment of quality of life of individuals with olfactory dysfunction. In the research group, 58% of respondents reported problems with taste.

CONCLUSION

The research drew attention to the quality of life of people with impaired sense of smell. While 42% of patients feel severely impaired, 43% feel slightly disadvantaged, and only 15% do not feel impaired at all. The olfactory dysfunction is noticeable in everyday life by 62% of respondents. No relationship between the perception of the severity of the olfactory dysfunction and the impact on quality of life was identified. Women are troubled by olfactory dysfunctions more than men. Monitoring the perception of problems and quality of life is an important part of comprehensive care for patients. The assessment of olfaction function, psychological support, and the education of patients about the course of the examination, olfactory training, and the risks associated with impaired sense of smell are part of comprehensive nursing care. Although smell disorders are perceived in everyday activities, the quality of life of persons with olfactory dysfunction is rarely mentioned in Czech literature.

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