

State and trait anxiety in patients affected by nasal polyposis before and after medical treatment

Ansia di stato e di tratto in pazienti affetti da poliposi nasale prima e dopo trattamento medico

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Key words

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Parole chiave

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Summary

The present study aimed to establish whether anxiety and depression in nasal polyposis play a role in genesis of the disease, or are a consequence of symptoms. Anxiety levels were evaluated in state and trait forms, and depression, in 30 consecutive patients presenting nasal polyposis before and after effective 7 months' medical treatment with nasal mometasone, loratadine and montelukast. Before and at the end of treatment, patients were asked to fill in the State and Trait Anxiety Inventory and the Zung self-rating depression scale. In 63.15% of patients with high levels of state anxiety before therapy, these were reduced ($p < 0.004$) after treatment. In 61.9% of patients with high levels of trait anxiety before treatment, these were reduced ($p < 0.002$) after treatment. There were no significant differences in depression. Anxiety in nasal polyposis is present both as a state and as a trait, and is significantly reduced after effective medical treatment, showing that anxiety is a reversible consequence of nasal polyposis in most cases.

Riassunto

Abbiamo valutato il ruolo dell'ansia e della depressione nella poliposi nasale (NP), per indagare se esistano implicazioni nella patogenesi o siano da considerare una conseguenza dei sintomi. Sono stati valutati i livelli di ansia nelle due forme di stato e di tratto, e la depressione in un gruppo di 30 pazienti consecutivi affetti da NP prima e dopo trattamento medico di 7 mesi risultato efficace con mometasone nasale, loratadina e montelukast. All'inizio e al termine del periodo di trattamento sono stati somministrati i questionari per la valutazione dell'ansia di stato e di tratto (STAI) e per la valutazione della depressione con la scala di Zung. Il 63,15% dei pazienti con elevati livelli di ansia di stato prima dell'inizio della terapia ha riportato un significativo miglioramento ($p < 0,004$) al termine del trattamento. Il 61,9% dei pazienti con elevati livelli di ansia di tratto prima dell'inizio della terapia ha riportato una riduzione significativa della stessa ($p < 0,002$) al controllo dopo la fine del trattamento. Non abbiamo rilevato differenze significative per quanto riguarda la depressione. L'ansia nella NP è presente in entrambe le sue forme, di stato e di tratto, e viene ad essere significativamente ridotta dopo terapia medica efficace, con evidenza che l'ansia nella NP rappresenta una conseguenza reversibile nella maggioranza dei casi.

Introduction

Much controversy exists not only concerning the pathogenesis of nasal polyposis (NP) but also the most effective treatment, whether surgical or medical, to prevent recurrences. Recently, a new medical treatment, developed for asthma, based on montelukast (a cysteinyl-leukotriene receptor antagonist), has been proposed as being effective in NP, even in association with nasal steroid and/or antihistaminic drugs¹⁻³. So far no studies have been carried out on the influence of NP on quality of life and the role played by psychological disorders, such as anxiety and depression, in patients with NP, evaluating whether they change after

medical treatment. In fact, so far, no studies on patients affected by NP appear to have been carried out using validated psychometric instruments able to distinguish state and trait forms of anxiety.

We recently evaluated state and trait anxiety and depression in patients with allergic rhinitis and vasomotor rhinitis and found that anxiety was present both as a state and as a trait in the two groups, without depression⁴. Several other studies have demonstrated associations between anxiety disorders (mostly panic disorders) and allergy, both in adults and children⁴⁻⁷.

The aim of the present study was, therefore, to evaluate state and trait anxiety and depression in patients

with NP, before and after medical treatment, using the State and Trait Anxiety Inventory (STAI) and the Zung self-rating depression scale. If anxiety was found to be present, our aim was to investigate whether the level is modified after effective medical treatment.

Materials and methods

PATIENTS

A total of 30 consecutive patients were enrolled (16 male, 14 female, age range 18-77 years, mean 45.6), all affected by idiopathic ethmoidal NP, primary or recurrence. Patients affected by asthma, mental diseases, chronic diseases, in general, or used any other drugs during the study, were excluded. All patients received montelukast (MLK 10 mg/day) + loratadine (LOR 10 mg/day) + mometasone furoate (MOM 100 µg per nostril/day) for 7 months and underwent a monthly follow-up, with nasal endoscopy, in order to evaluate the efficacy of the treatment (personal polyps score used: 0 = no polyp, 1 = in middle meatus, 2 = outside middle meatus, 3 = contact with inferior turbinate, 4 = contact with nasal floor), anterior active rhinomanometry (AAR), record cards for nasal symptoms (score for each symptom from 0 = good to 4 = bad). None of these drugs have sedative or anxiety-reducing effect⁸.

All patients were included in the study group after a run-in period of at least 1 month without any therapy apart from nasal washes with saline solution, this was considered necessary also in order to prevent the possible influence of other drugs on mood^{9 10}.

PSYCHOLOGICAL ASSESSMENT

All patients were asked to fill in a questionnaire, before and at the end of the treatment, concerning information on their level of education and socioeconomic status, and containing two different self-rating psychometric tests: one for anxiety and the other for depression. For anxiety assessment, the STAI was used which comprises two axes (y1 for state anxiety and y2 for trait anxiety), both consisting of 20 multiple-choice items in which a score of > 40 is

considered high¹¹; this test, based on the difference between "state" and "trait" anxiety makes it possible to distinguish between existing anxiety and the presence of anxiety as a transitory state and anxiety as a relatively stable personality trait. The patients evaluated were classified as high anxious and low anxious, and a median value of > 40 was used to distinguish the two groups, as previously described¹². As far as concerns assessment of depression, the Zung self-rating depression scale was used¹³, consisting of 20 multiple-choice items in which a score ≥ 49 is considered high. This test is an effective screening instrument for current depression in a clinical setting¹⁴, and the positive predictive value to diagnose depression is between 88.7% and 92.3%¹⁵.

STATISTICAL ANALYSIS

Chi-square analysis was utilized to compare the percentage of patients with high levels of anxiety and depression before and after treatment and to check for significance. Pearson "p" was used for having points between 0-1 ($0 < p < 1$). A $p < 0.005$ was considered significant.

Results

All patients showed a significant reduction of NP, at nasal endoscopy, and reduction of symptoms and nasal resistance, at AAR (Table I). Of those patients with NP prior to treatment, 19 (63.3%) showed high levels of state anxiety, 21 (70%) showed anxiety as a trait, and 6 (20%) were positive for depression. After the medical treatment, 7 patients (23.3%) showed high levels of state anxiety, 8 (26.6%) showed anxiety as a trait, and 5 (16.6%) were positive for depression. The percentage of patients with high levels of state anxiety was significantly higher before treatment than after (63.3% vs. 23.3%; $\chi^2 = 0.14$; $p = 0.004$) equivalent to the percentage of patients with high levels of anxiety as a trait (70% vs. 26.6%; $\chi^2 = 0.10$; $p = 0.002$); whilst there was no significant difference in depression before and after treatment (20% vs. 16.6%; $\chi^2 = 1.11$; $p = 0.090$). Of 19 patients, 63.15% (12/19 patients) who resulted positive for state anxiety before treatment, recovered

Table I. Mean values of nasal resistance at AAR (Pa/cc/sec), nasal endoscopic scores and nasal symptoms, before and after treatment ($p < 0.05$).

Time	AAR	Endoscopy	Nasal obstruction	Rhinorrhea	Sneezing	Post-nasal drip
T0	2.52	3.2	3.8	3.6	2.6	3.6
7 months	1.22	1.6	1.2	1.3	1.2	1.8

Table II. Comparison and statistical analysis of results.

	N. patients before treatment	N. patients after treatment	% of patients improved	Chi-square	Pearson p
State anxiety	19	7	63.15	0.14	0.004
Trait anxiety	21	8	61.90	0.10	0.002
Depression	6	5	16.6	1.11	0.090

after medical treatment. Of the 21 patients, 61.90% (13/21 patients) who resulted positive for trait anxiety before treatment, recovered after treatment. Only 16.6% (1/6 patients) affected by depression (not significant), recovered after medical treatment (Table II).

Discussion

Results of the present study demonstrate that state anxiety in patients with NP is significantly reduced after effective medical treatment. One potential mechanism of anxiety reduction is the removal of airways obstruction⁴. Any blockage of the airway, such as NP, is likely to cause increased anxiety. For this reason, if a medical treatment is effective in the reduction of nasal obstruction, anxiety may be reduced. The presence of state anxiety could be linked to the presence of chronic illness with consequent repercussion on psychological conditions¹⁶, as shown also in studies on allergic and vasomotor rhinitis demonstrating that anxiety disorders in patients with chronic diseases significantly affect the quality of life of these patients^{4 17 18}.

Patients with NP also showed a significant reduction of trait anxiety after medical treatment. Trait anxiety is a relatively stable and continuous predisposition to anxiety characterised by an increase in the activity of the autonomous nervous system⁴. The aetiopathogenesis of NP is not yet clear, but it is accepted that specific mediators, such as histamine, leukotrienes, interleukins, growth factors, interferons, neurotransmitters, and others, are important in the early or late development of the polyps^{19 20}. The immuno-phlogosis mediated by these mediators leads to oedema of the rhinosinusal mucosa leading to development of polyps, which has recently been successfully treated

with a topical diuretic drug²¹. The inflammatory cells (mast-cells, eosinophils, lymphocytes) are located in the human mucosa close to nerve fibers²². Psychological stress, particularly in subjects with trait anxiety, could enhance the mediator release and the symptoms of NP could, in part, be secondary to the activation of the inflammatory cells, regulated in part by the central nervous system (CNS) through the peripheral nerves, as seen in allergic reactions²³. It is tempting to hypothesize that an improvement in the nasal condition, with a reduction in the release of neuro-mediators, could even modify trait anxiety, usually considered a stable trait of personality, due to less stimulation of the autonomous nervous system fibers and their connections with CNS. At present, no experimental model is available to confirm these hypotheses, but further studies are in progress in order to better understand the possible pathogenetic mechanism.

The NP symptoms, are not particularly painful but are, however, irritating, leading to irritability rather than depression. In fact, we found a low incidence of depression in NP patients, and it was not affected by medical treatment or by clinical improvement. Depression does not appear to be related to NP, according to our results.

Hopefully the present findings will stimulate researchers to develop more and more effective forms of medical treatment for NP, since it would appear not only to drastically reduce size of the polyps, with improvement of nasal flow, but also to improve the psychological symptoms of these patients.

In conclusion, results emerging from this study show that anxiety in these patients is present in both forms (state and trait), at least when measured with the STAI, and that these are reduced after effective medical treatment, thus showing that anxiety is a reversible consequence of nasal polyposis, in most cases.

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