



(RESEARCH ARTICLE)



Comparison of quality of life in chronic rhinosinusitis patients based on SNOT-22 before and after administration of saline nasal irrigation at Sanglah General Hospital Denpasar

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Abstract

Introduction: Rhinosinusitis is an inflammation of the mucosa nasal cavity and paranasal sinuses and still a health problem in both developing and developed countries with a high prevalence and impacts in various aspects including quality of life and socioeconomics. Chronic rhinosinusitis occurs in 12.5% of the US population or 31 million patients per year. Saline nasal irrigation is a conservative treatment that can be used in patients with rhinosinusitis. Currently, SNOT-22 questionnaire is the best specific questionnaire that can be applied to assess the quality of life of chronic rhinosinusitis patients.

Objective: To determine the impact of nasal saline irrigation on the quality of life of patients with chronic rhinosinusitis.

Methods: This research is an observational study of the one-group test posttest design (before-after study). The selection of samples from all patients chronic rhinosinusitis who come to the ENT-KL polyclinic at Sanglah General Hospital Denpasar from October 2019 to December 2020

Result: In this study, the total sample that met the inclusion criteria was 52 people. In this research, it was found that the majority of the research subjects were male as many as 28 sufferers or 53,8%. Based on age, the majority of subjects were aged 25–44 years, namely 24 (46.1%). Based on the characteristics of comorbid diagnoses, there were 22 (42.3%) subjects with turbinate hypertrophy and septal deviation. The mean difference in improvement of SNOT-22 score was found to be 22.4 with a p value of <0.001.

Conclusion: From this study, it was found that the most characteristics of research subjects were male, aged 25-44 years, with concomitant diagnoses of turbinate hypertrophy and septal deviation. There was a significant improvement in quality of life based on the SNOT-22 score in patients with chronic rhinosinusitis after administration of saline nasal irrigation.

Keywords: Quality of life; SNOT-22; Chronic rhinosinusitis; Saline nasal irrigation

1. Introduction

Rhinosinusitis is an inflammation of the mucosa nasal cavity and paranasal sinuses that can be acute, subacute or chronic and have an impact the quality of life of the sufferer. Rhinosinusitis can be multifactorial and can be caused by allergies, anatomical abnormalities or mucocilia disorders, making it easier for respiratory tract infections by bacteria, viruses, allergens or other irritants [1].

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Acute rhinosinusitis that is not treated properly can progress to chronic rhinosinusitis. Chronic rhinosinusitis can lead to impaired quality of life due to local symptoms such as headaches, nasal congestion, olfactory disorders, sleep disorders and persistent cold symptoms that can reduce the productivity of patients and cause loss of working days [3].

Chronic rhinosinusitis is still a health problem in both developing and developed countries with a high prevalence and impacts in various aspects including quality of life and socioeconomics. Chronic rhinosinusitis occurs in 12.5% of the US population or 31 million patients per year. According to the analysis of *National Health Interview Data* in 2008, rhinosinusitis occurs in an average of 1 in 7 adults. In the ENT-KL Polyclinic of RSUD Dr.Moewardi Surakarta, the number of chronic rhinosinusitis recorded in 2014 was 204 cases (13.1%) out of 1567 outpatients [2,4].

Currently, rhinosinusitis treatments are divided into conservative treatments and surgical. Saline nasal irrigation is a conservative treatment that can be used in patients with rhinosinusitis.

To find out the success of saline nasal irrigation, subjective and objective evaluation are conducted. Subjective evaluation is conducted by evaluating the quality of life of patients with chronic rhinosinusitis at various times before and after the administration of nasal saline irrigation.

Currently, SNOT-22 questionnaire is the best specific questionnaire that can be applied to assess the quality of life of chronic rhinosinusitis patients. Therefore, it is necessary to study the comparison of SNOT-22 (*Sino - Nasal Outcome Test - 22*) in chronic rhinosinusitis patients, before and after the administration of nasal saline irrigation at Sanglah General Hospital Denpasar from October to December 2020.

2. Material and methods

This research is an observational study of *the one-group test posttest design (before-after study)*. The selection of samples used in this study used a consequential sampling technique. Inclusion criteria are all patients who come to the Sanglah Denpasar THT-KL RSUP Poli from October 2019 to December 2020 who suffer from chronic rhinitis with or without a diagnosis in other areas of rhinitis and undergo nasal saline irrigation therapy. Exclusion criteria are patients with rhinosinusitis with incomplete medical records and chronic rhinosinusitis patients who cannot be contacted either by direct meeting in person or by phone.

An assessment and statement of the ethical suitability of this study was provided by the Research Ethics Commission of the Faculty of Medicine, Udayana University, Sanglah Hospital Denpasar (2718/UN/14.2.2.VII.14/LT/2022)

3. Results

This study is a pre-experimental observational study of *the one-group posttest design (before-after study)*, where the research subjects were chronic rhinosinusitis patients who were given saline nasal irrigation. Then the assessment and comparison of quality of life using SNOT-22 (*Sino Nasal Outcome Test-22*) before and after the administration of saline nasal irrigation. The sample selection used *consecutive sampling*, where every patient with chronic rhinosinusitis who was given saline nasal irrigation at Sanglah Hospital Denpasar from October to December 2020 and who met the inclusion criteria and did not have exclusion criteria was used as a research sample. As a result, 52 samples were obtained.

3.1. Characteristics of Research Subjects

In this study, the total sample that met the inclusion criteria was 52 people. Data on sample characteristics are presented in table form. Based on table 1, there were 28 (53.8%) male subjects and 24 (46.2%) female subjects.

Table 3 Characteristics of research subjects based on gender

Gender	N	%
Male	28	53.8
Female	24	46.2
Total	52	100

Based on table 2, there were 24 (46.1%) subjects aged 25 - 44 years, 16 (30.7%) subjects aged 45 - 64 years, 10 (19.4%) subjects aged 15 - 24 years, 1 (1.9%) subject aged under 14 years, and 1 (1.9%) subject aged > 65 years. In the age characteristics, the mean age of the subjects was 38.03 years with an SD value of ± 13.50 years, where the youngest subject was 10 years old and the oldest was 77 years old. Based on the age category by the *Provisional Guidelines on Standard International Age Classifications*, the most subjects were obtained at the age of 25 - 44 years, namely 24 subjects (46.1%).

Table 4 Characteristics of research subjects based on age

Age	N	%
0-14	1	1.9
15-24	10	19.4
25-44	24	46.1
45-64	16	30.7
> 65	1	1.9
Total	52	100

Based on table 3 the characteristics of accompanying diagnoses, obtained from 52 subjects with chronic rhinosinusitis, 22 (42.3%) subjects with turbinate hypertrophy and septal deviation, 18 (34.6%) subjects with turbinate hypertrophy, 5 (9.61%) subjects without accompanying complaints, 4 (7.69%) subjects with nasal polyps and 3 (5.76%) subjects with septal deviation.

Table 5 Characteristics of comorbid diagnoses

Comorbid Diagnosis	N	%
Turbinate hypertrophy	18	34.6
Septal Deviation	3	5.76
Turbinate hypertrophy + septal deviation	22	42.3
Nasal cavity polyps	4	7.69
without comorbidities	5	9.61
Total	52	100

3.2. Comparison of quality of life based on SNOT-22 between before and after administration of saline nasal irrigation

The improvement in quality of life between before and after administration of saline nasal irrigation based on SNOT-22 can be seen in Table 6. The total score of SNOT-22 before administration of saline nasal irrigation was 74.41 with an SD value of ± 6.9 . The total SNOT-22 score after saline nasal irrigation was 52.01 with an SD ± 5.2 . The mean difference in improvement was found to be 22.4 with a p value of <0.001 . A comparison of the total SNOT-22 score between before and after surgery can be seen in Figure 6.

Table 6 Comparison of total SNOT-22 score between before and after nasal saline irrigation

Variable	Before	After	Average Difference (Improvement)	95% CI	Percentage p
Total score SNOT-22	74.41 \pm 6.9	52.01 \pm 5.2	22.4	32.7 - 39.9	<0.001

4. Discussion

This study was conducted to determine and assess the improvement in the quality of life of patients with chronic rhinosinusitis between before and after being given saline nasal irrigation. This research is a pre-experimental study of *the one group pre-post test design (before-after study)*. The prospective study was conducted at the ENT-KL polyclinic of Sanglah General Hospital with the target population being chronic rhinosinusitis patients who were given saline nasal irrigation.

In this research, it was found that the majority of the research subjects were male as many as 28 sufferers or 53.8%. This is in accordance with the results of Eski's research in 2012, which obtained a ration of male and female of 1.35:1. Datta et al.'s study also found that 36 patients were male out of 53 chronic rhinosinusitis patients. The research conducted by Kennedy et al., reported that of 104 patients with rhinosinusitis, the majority of study subjects were male 58%. In various literatures, there is no mention of the relationship between gender and the incidence of chronic rhinosinusitis [5,6].

Based on age, the majority of subjects were aged 25–44 years, namely 24 (46.1%). This is consistent with Delfitri's 2006 research at Adam Malik Hospital Medan, which discovered that the majority of rhinosinusitis patients were aged 35–44 years by 30%. In Bestari's study in 2012, the most cases of chronic rhinosinusitis occurred in the age group of 15–49 years by as much as 61.9%. According to Fokken et al., this prevalence increased with increasing age, with an average of 2.7% and 6.6% in the age groups 20–29 and 50–59 years, respectively [2,7].

Based on the characteristics of comorbid diagnoses, there were 22 (42.3%) subjects with turbinate hypertrophy and septal deviation and 18 (34.6%) subjects with turbinate hypertrophy only. A total of 33 ENT-KL polyclinic patients at Dr. Zainal Abidin Hospital who had been diagnosed with chronic rhinosinusitis, 61.76% had turbinate hypertrophy and 23.5% had septal deviation. Johnson et al reported that of a total of 207 study samples conducted in Sweden, 135 of them were rhinosinusitis patients with turbinate hypertrophy and septal deviation. In Aramani's study, 53.7% of chronic sinusitis cases had two or more anatomical variations and 33.3% of cases had one anatomical variation. Turbinate hypertrophy was found most often among other anatomical variations [5].

4.1. Comparison of quality of life based on SNOT-22 between before and after administration of saline nasal irrigation

In this study, the total score of SNOT-22 before administration of saline nasal irrigation was 74.41 with an SD value of ± 6.9 . A higher total SNOT-22 score indicates that there is a disorder that affects the quality of life of the research subjects. This is because chronic rhinosinusitis has negative implications for several important aspects of the sufferer's quality of life. Disorders that occur in the nose, ears and face will then cause sleep disorders and will ultimately have an impact on the patient's daily activities. These impairments, which are rated directly by the patient in the SNOT-22 questionnaire, indicate the magnitude of the effect of rhinosinusitis on quality of life. It is also mentioned in the literature that chronic rhinosinusitis not only has a negative effect on several aspects of quality of life but also has an impact on socioeconomic aspects [8].

After administering saline nasal irrigation and then being evaluated two weeks later, the total SNOT-22 score was 52.01 with an SD value of 5.2, and the difference in mean improvement obtained was 22.4. This shows that there is an improvement in the quality of life of rhinosinusitis patients observed 2 weeks after the administration of nasal saline irrigation based on the total SNOT-22 score, which decreased. According to Johnson et al., the range of the SNOT-22 score is 0–110, where a lower score indicates a better quality of life. The minimum difference that is considered meaningful in this questionnaire is 8.9 points, so if there is a change in score of less than 9 points, it cannot be considered a real improvement in quality of life [9].

The decrease in score that occurred after administration of nasal saline irrigation indicated a decrease in complaints or disorders related to nasal, ear, and facial symptoms, sleep disorders, and psychological changes that occur as a result of chronic rhinosinusitis, either with or without additional comorbidities. This also shows the success of both medical therapy and nasal saline irrigation in treating patients with chronic rhinosinusitis. Improving the quality of life in patients with chronic rhinosinusitis after the administration of nasal saline irrigation will ultimately support the patient's productivity. This will also have a better impact on the socio-economic conditions of the patient [8,9].

According to Egan and Hickner's 2009 research, where symptoms of nasal obstruction in patients with chronic rhinosinusitis who received nasal saline irrigation therapy as measured by the SNOT-22 questionnaire, there was a decrease of four points lower in the first two weeks after the use of nasal saline irrigation, and 16 points lower in the

fourth week. Hauptman and Ryan in 2007, conducted a study of 80 acute and chronic rhinosinusitis patients who received 3% isotonic and hypertonic nasal saline irrigation. The results of this study showed statistically significant improvements in mucociliary transport time and nasal obstruction complaints in the groups receiving isotonic and hypertonic saline nasal irrigation [8].

Marambaia et al (2013) mentioned that the effects of chronic rhinosinusitis on the quality of life of patients have been well described in many world literatures. Compared to patients without rhinosinusitis, they need more days of rest and should also seek professional medical help. A quality of life assessment needs to be done to assess the severity of the disease and assess clinical efficiency and quality of patient care [5].

Chronic rhinosinusitis is said to account for 43% of polyclinic visits and 25% of emergency medical visits compared to patients who do not have chronic rhinosinusitis. Adult chronic rhinosinusitis patients, 85% of whom are working age (18-65 years old), will also cause a decrease in working days and productivity in the workplace, which will ultimately affect the patient's economic condition. In the end, with the improvement of the condition of chronic rhinosinusitis patients after administration of saline nasal irrigation, it is hoped that it will show an improvement in quality of life and be followed by a better socio-economic condition [6,7].

Chronic rhinosinusitis is an inflammatory process in the nasal mucosa and paranasal sinuses. Saline nasal irrigation is performed on the nasal cavity with the aim of improving clinical symptoms in chronic rhinosinusitis. Saline nasal irrigation not only clears accumulated secretions and improves mucociliary transport clearance in the nasal cavity, but the administration of saline nasal irrigation will also potentially improve the function of the sinuses by suppressing the inflammatory process in the mucosa of the osteomeatal complex so that air drainage in the sinus cavity improves [5].

5. Conclusion

From this study, it was found that the most characteristics of research subjects were male, aged 25-44 years, with concomitant diagnoses of turbinate hypertrophy and septal deviation. There was a significant improvement in quality of life based on the SNOT-22 score in patients with chronic rhinosinusitis after administration of saline nasal irrigation.

Compliance with ethical standards

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Disclosure of conflict of interest

The author reports no conflicts of interest in this work.

Statement of ethical approval

The present research work does not contain any studies performed on animals/humans subjects by any of the authors.

Statement of informed consent

Informed consent is not required because taking secondary data.

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