Main Article

An Outcome Analysis of Endoscopic Sinus Surgery in Chronic Sinusitis with Chronic Rhinitis Non-responsive to Medical Therapy

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ABSTRACT

Introduction

Chronic sinusitis with chronic rhinitis affect the patients' quality of life significantly. Aim of this study is to assess the outcome of Endoscopic Sinus Surgery (ESS) in terms of Quality of Life (QoL) in patient with Chronic Sinusitis with Chronic Rhinitis (CSCR), non-responsive to medical therapy.

Materials and Methods

Prospective study was conducted among 75 patients of CSCR non responsive to medical therapy in the age group of 15 to 80 years over a period of 18 months (January 2018 to June 2019). The subjects were randomly grouped into two, namely Group 1- CSCR with Polyp and Group 2- CSCR without Polyp. Subjects were asked to complete SNOT-22 score and Visual analogue scale (VAS) and conventional medical treatment was given for 2 weeks. Those failed to respond as per EPOS guideline were subjected to ESS and followed up at 6 weeks and 12 weeks, re-assessed by SNOT-22 questionnaire and VAS. Data was analyzed by using Paired t- test.

Results

Statistically significant (p-value <0.05) improvement in symptom score assessing QoL after Endoscopic sinus surgery.

Conclusion

Patients with CRS non- responsive to medical treatment, the decision for surgery should be guided by their pre-operative QoL impairment, as measured by SNOT-22 and VAS.

Keywords

Chronic Sinusitis ; Chronic Rhinitis; Endoscopic Sinus Surgery; Sino Nasal Outcome Test; Visual Analog Scale

Chronic sinusitis with chronic rhinitis is defined as inflammation in the nose and paranasal sinus and it is characterized by two or more cardinal symptoms such as nasal obstruction, rhinorrhea, hyposmia, and facial pain for 12 weeks or longer.

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Chronic sinusitis with chronic rhinitis is one of the most prevalent chronic illnesses and has a considerable impact on quality of life and health care expenditure.[1] According to EPOS 2012 chronic sinusitis with chronic rhinitis is defined as inflammation of the nose and the paranasal sinuses characterized by two or more symptoms for ≥ 12 weeks, one of which should be either nasal blockage/ obstruction/congestion or nasal discharge (anterior/ posterior nasal drip), ± facial pain/pressure, ± reduction or loss of smell and either endoscopic signs of nasal polyps, and/or mucopurulent discharge primarily from middle meatus and/or oedema/mucosal obstruction primarily in middle meatus and/or CT changes of mucosal changes within the ostio-meatal complex and/or sinuses.[2]

However, in most of the literature the term Chronic Rhinosinusitis (CRS) has been used, but in the International Convention on Disease Classification Code in 2010, there are separate coding for Chronic sinusitis and Chronic rhinitis i.e. ICD-J32 and ICD-J31 respectively. In certain instances, they may be associated with Nasal Polyps (ICD-J 33).[3]

Chronic sinusitis with chronic rhinitis has been divided into two phenotypes according to the presence of nasal polyps on endoscopy: CRS with nasal polyps (CRSwNP) and CRS without nasal polyps (CRSsNP).

It causes a significant physical symptom, decreases Quality of Life (QOL), and impairs daily functioning resulting in millions of days of lost productivity with the significant impact on the economy.

At present, chronic sinusitis with chronic rhinitis remains a symptom-based diagnosis and the extent of symptoms remains the overriding factor motivating to seek medical treatment. Given this situation, the study of patient centered disease impact is critical to understand outcome after Endoscopic Sinus Surgery (ESS). To date, a number of rhinology specific instruments have been developed to measure the 'Quality of life' in patients with rhinological condition, including the Chronic Sinusitis Survey (CSS), Rhinosinusitis Disability Index (RSDI), Rhinoconjunctivitis Quality of Life Questionnaire (RQLQ) and most recently the Sinonasal Outcome Test-22 (SNOT 22). These instruments provide a validated means to objectively quantify the patient perception of their disease burden both before and after intervention.[4] Among disease- specific outcome measures, SNOT 22 has been considered the most suitable tool for assessing chronic sinusitis with chronic rhinitis.[5]

Despite great advances in the elucidation of its pathophysiology, the exact etiology of chronic inflammatory conditions of the nose and sinuses is still largely unknown. But it does have multiple exacerbating or disease modifying factors including infections (viral, bacterial, and fungal), anatomic, allergic, genetic or congenital mucociliary dysfunction and systemic disorders. Altered Eosinophil function and IgE mediated disease process are two factors that have been implicated in the pathogenesis of chronic rhinosinusitis.[6]

A wide range of medical and surgical therapies has been used to treat chronic sinusitis with chronic rhinitis. Medical therapy of chronic sinusitis with chronic rhinitis includes antimicrobials, corticosteroids, decongestants, antihistamines, mast cell stabilizers, antileukotrienes, nasal douching, immunotherapy and reduction of irritant environmental factors. On the other hand, sinus surgery is broadly classified into conventional and endoscopic sinus surgery, with endoscopic sinus surgery largely replacing conventional sinus procedures.[7] With this background, we conducted a study to compare quality of life before and after Endoscopic Sinus Surgery (ESS).

Materials and Methods

A prospective observational study was conducted among 75 patients of Chronic sinusitis with chronic rhinitis non responsive to medical therapy in the age group of 15 to 80 years attending the outpatients wing of Otorhinolaryngology Department at peripheral tertiary care hospital over a period of 18 months (January 2018 to June 2019). Ethical clearance was obtained from the institute's ethical clearance committee. Informed consent was taken from the cases after explaining the procedure. For this study we selected patients of Chronic sinusitis with Chronic Rhinitis, with or without polyp who were non-responsive to 'Standard Medical Regimen' of EPOS-2012, for two weeks. Patients with proven acute infection, Cystic fibrosis, Primary ciliary dyskinesia, very low general condition/ severe medical disability/ unsound mental status were excluded. Those who did not wish to participate and cases of Chronic sinusitis with Chronic Rhinitis, with or without polyp below 15 years and beyond 80 years (due to unreliable response in SNOT-22 questionnaire) were also excluded.

After thorough clinical history and examination as well as other necessary investigation, the study subjects were randomly grouped into 2 main groups Group 1- Chronic sinusitis with chronic rhinitis with Polyp and, Group 2- Chronic sinusitis with chronic rhinitis without Polyp. The subjects were asked to complete SNOT 22 score and Visual analogue scale (VAS). These subjects were then started with conventional medical treatment for 2 weeks including Intra-nasal Fluticasone, Saline Nasal Irrigation, a course of Antibiotic as-oral Amoxycillin with Clavulanic Acid for 2 weeks and

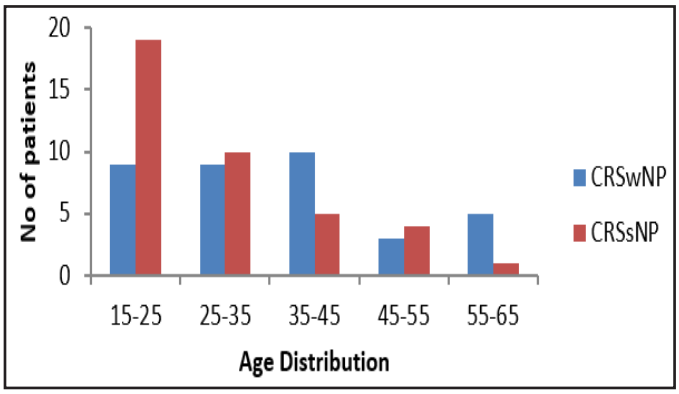

Fig. 1. Bar diagram showing distribution of study population based on age.

a short course of Oral Corticosteroid for 2 weeks in cases with Nasal Polyps. Those who failed to respond as per EPOS guideline where subjected to Endoscopic sinus surgery. Post- operatively individuals have been followed up at 6 weeks and 12 weeks and re-assessed by SNOT 22 questionnaire and VAS. Data was analyzed by using Paired t-test.

Results

Among 75 patients, the mean age was 36.5 years in Group 1, ranging from 16-60 years and 29.7 years in Group 2, ranging from 16-58 years. Group 1 comprised of 36 individuals, having 22 (61.1%) male and 14 (38.9%) female with male: female ratio of 1.6:1. Group 2 comprised of 39 individuals, 23 (59%) male and 16 (41%) female with male: female ratio of 1.4:1. (Fig.1)

The 'Twenty-two-point Sino-nasal outcome test' (SNOT 22) has been statistically classified into mild, moderate and severe (MMS), with 'Mild' being defined as 8-20 inclusive, 'moderate' as >20-50 and 'severe' as >50. A score of less than 8 considered normal. Similarly, 'Visual Analogue Scale' (VAS) patient-classification rated measure of severity for CRS: 'mild' as being 0-3 inclusive, 'moderate', as >3-7 inclusive and 'severe' as >7-10 inclusive (MMS).[6,7]

In our study, among 36 patients with CRSwNP, 16(44.4%) patients had moderate and 20 (55.6%) patients had severe SNOT-22 Score (pre-operatively before medication), but after medication, 8 (22.2%) patients had mild, 19 (52.8%) patients had moderate and 9 (25%) patients had severe SNOT 22 score. After Endoscopic Sinus Surgery (ESS), 7 (19.4%) patients had normal, 20 (55.6%) patients had mild, 7 (19.4%) patients had moderate and 2 (5.6%) patients had severe at 6 weeks, whereas 20 (55.6%) patients had normal, 7 (19.4%) patients had mild, 7 (19.4%) patients had moderate and 2 (5.6%) patients had severe at 12 weeks. (Fig. 2)

Likewise, the study individuals were classified into mild, moderate, and severe VAS Score. Pre-operatively, 11 (30.6%) patients had moderate and 25 (69.4%) patients had severe score before medication, but 26 (72.2%) patients had moderate and 10 (27.8%) patients had severe score after medication. VAS Score (post-operatively), 21 (58.3%) patients had mild and 15 (41.7%) patients had moderate at 6 weeks, but 27 (75%) patients had mild and 9 (25%) patients had moderate at

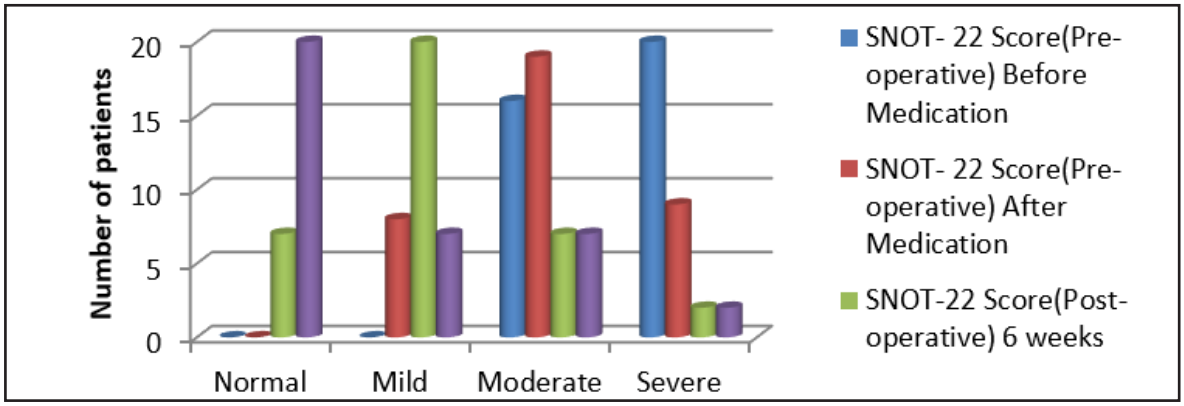

Fig. 2. Cluster bar diagram showing distribution of the study population with CRSwNP according to MMS classification of SNOT 22.

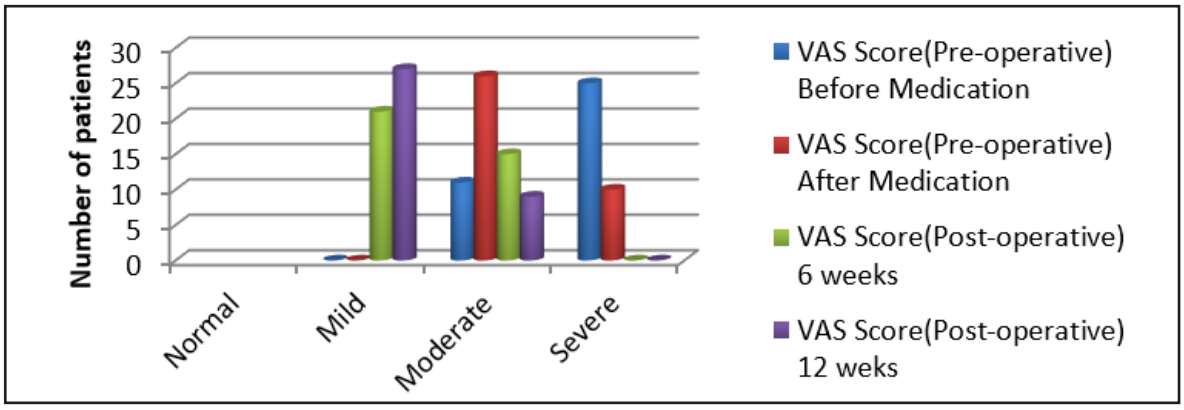

Fig. 3. Cluster bar diagram showing distribution of the study population with CRSwNP according to MMS classifiation of VAS.

12 weeks. (Fig. 3)

Among 39 patients of CRSsNP, 25 (64.1%) patients had moderate and 14 (35.9%) patients had severe SNOT 22 score before medication, 36 (92.3%) patients had moderate and 3 (7.7%) patients had severe after medication. After Endoscopic Sinus Surgery (ESS), 2 (5.1%) patients had normal, 26 (66.7%) patients had mild, 10 (25.6%) patients had moderate and 1 (2.6%) patient had severe at 6 weeks, and after 12 weeks, 21 (53.8%) patients had normal, 10 (25.6%) patients had mild 7 (17.9%) patients had moderate and 1 (2.6) patient had severe score. (Fig. 4)

Similarly, VAS Score(pre-operatively), 2 (5.1%) patients had moderate and 37 (94.9%) patients had severe score before medication, but 31 (79.5%) patients had moderate and 8 (20.5%) patients had severe score after medication. Post-operatively, 15 (38.5%) patients had normal and 24 (61.5%) patients had mild VAS score at 6 weeks, whereas 30 (76.9%) patients had normal and 9 (23.1%) patients had mild at 12 weeks. (Fig. 5).

According to Mild, Moderate and Severe (MMS) classification for both SNOT 22 and VAS, there was significant improvement in patients symptom score in both the groups after endoscopic sinus surgery.

The two main group have been compared among each other, using mean value and standard deviation and the statistical significance was seen by calculating p-value, by using unpaired t- test(p-value <0.05 is significant) in terms of SNOT 22 score and Visual Analogue Scale (VAS).

In Group 1 and Group 2, the mean value of SNOT 22 were 50.4±17.5 and 46.3±11.5 before medication, 35±18.5 and 33.2±10.7 after medication, 17.8±15.2 and 17.7±11.7 after 6 weeks post-operatively, and 13.1±14.9

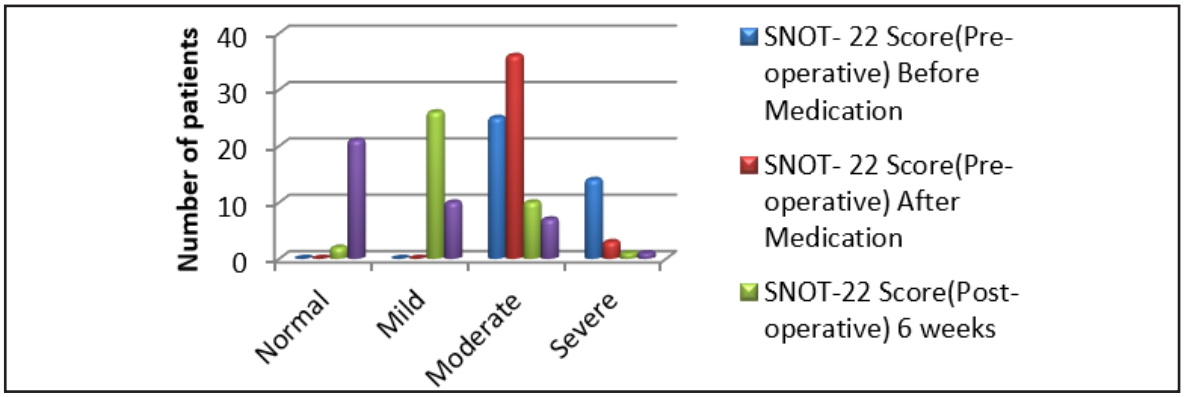

Fig. 4. Cluster bar diagram showing distribution of the study population with CRSsNP according to MMS classification of SNOT 22.

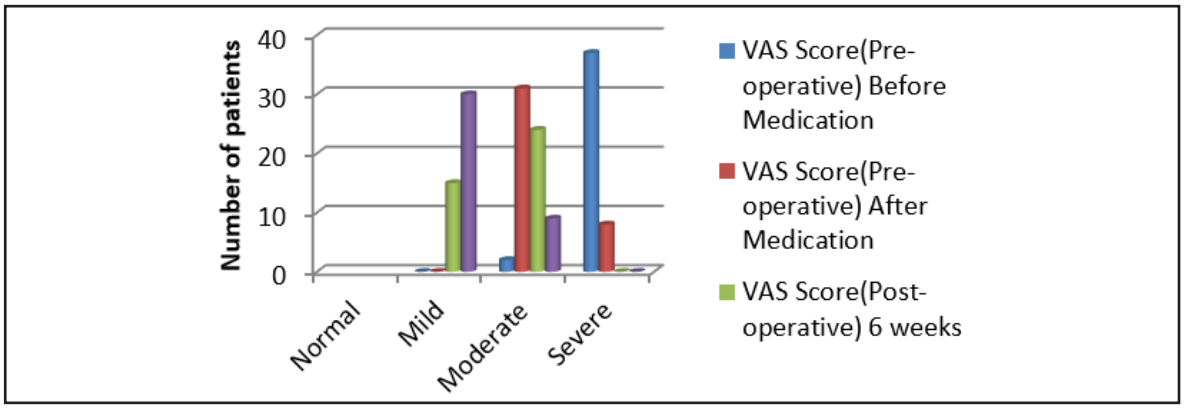

Fig.5. Cluster bar diagram showing distribution of the study population with CRSsNP according to MMS classification of VAS.

and 11.9±12 after 12 weeks of surgery, respectively. There was significant improvement in SNOT 22 score after endoscopic sinus surgery in both the groups (Fig. 6). But no statistical significance in SNOT 22 score between group 1 and group 2 in unpaired t-test.

The mean value of VAS in group 1 and group 2, were8.4±1.4 and 8.8±0.9 before medication, 6.2±1.8 and 6.5±1.4 after medication, 3.4±1.9 and 3.9±1.4 after 6 weeks post-operatively, and 2.5±1.8 and 2.6±1.5 after 12 weeks of surgery, respectively. There was significant improvement in VAS score after endoscopic sinus surgery in both the (Fig. 7). But no statistical significance could be demonstrated in VAS between Group 1 and Group 2 in unpaired t-test.

Both group 1 and group 2 showed statistically significant improvements in SNOT 22 score and VAS post-operatively, as the p-value of this score is <0.05 in paired t-test.

Discussion

Chronic sinusitis with chronic rhinitis (CRS) is a significant health problem which seems to mirror the increasing frequency of allergic rhinitis and which results in a large financial burden on society. Recent data have demonstrated that CRS affects approximately 5–15% of the general population. The prevalence of doctor-diagnosed CRS was found to be 2-4 %.[8]

There was no difference in CRS prevalence according to age in a study from Germany,[9] CRS prevalence is reportedly higher in adults of aged 18-64 years in the United States and Europe[10] and is most prevalent in

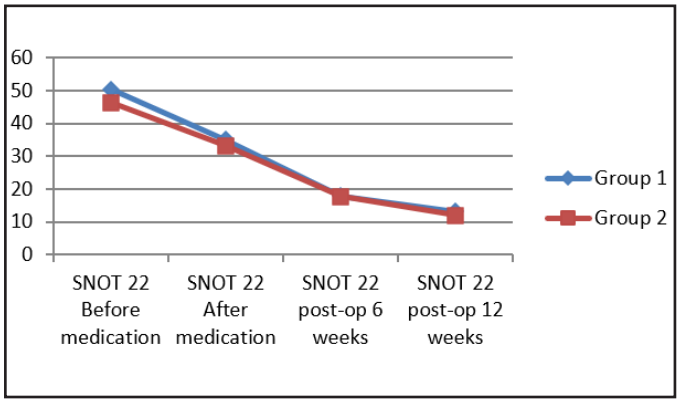

Fig. 6. Line diagram showing mean value for SNOT 22 score in group 1 (CRSwNP) and group 2 (CRSsNP)

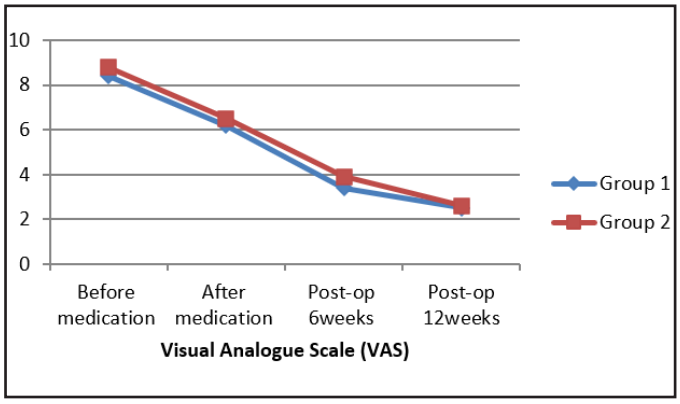

Fig. 7. Line diagram showing mean value for VAS score in Group 1 (CRSwNP) and Group 2 (CRSsNP)

the United States between the age of 40 and 64 years.[11] Although the 1996 Korean study reported no statistically significant difference in CRS with respect to gender and age, the 2011study revealed significantly higher prevalence in male gender.[12]

In the study conducted by Fadda et al. 60.7% were male and 39.3% were female with ages ranging from 13 to 77 years (mean 45.5 years).[13] In another study conducted by Kaygusuz et al. 25.2 % were female and 74.7 % were male. The mean age was 32.2 ranging from 13 to 70.14 Similarly, in the study by Pullarat et al. 58% were males and 42% were females. The mean age of the patients was 33.7 years.[15] Hopkins et al. in their study found 60% male and 40% female. The mean age was 50.5 years (range 16–88).[16] Present study comprised of (60%) male and (40%) female with mean age 32.9 years ranging from 16 to 60 years. Our study correlates with the study conducted by Fadda et al,[13] Kaygusuz et al,[14] Pullarat et al,[15] Hopkins et al[16] where male patients predominate over female patients.

Quality of life (QoL) is a general term integrating several aspects of life such as physical, psychological, social, economical, emotional, cognitional, and sexual dimensions. A disturbance in any one of these aspects will in turn affect the other domains and influence the overall QoL. The measures of QoL have evolved as the emphasis on medical care has shifted from symptom scores and objective test results to an assessment of patient-centered effect of disease and response to treatment. The QoL instruments have proved to be very useful providing comparative data with other medical conditions, which could be regarded as more serious.[17]

The pre-operative mean value of SNOT 22 in a patient of CRS with nasal polyp is 50.4±17.5 and CRS without nasal polyp is 46.3±11.5. The findings of present study correlate well with other studies done by Hopkins et al (2007) were the pre- operative mean value of SNOT 22 in CRSwNP was 43.0± 20.0 and mean value for CRSsNP was 44.1± 20.4.18 Similarly, in the study conducted by Sharma et al (2015) the pre- operative mean value of SNOT 22 in CRSwNP was 45.13± 2.87 and mean value in CRSsNP was 44.21 ± 2.85.[19]

In present study the pre-operative mean VAS in CRS with nasal polyp and CRS without nasal polyp is 8.4±1.4 and 8.8±0.9, respectively. The finding correlates with the study conducted by Johnson et al.[20] were pre-operative mean VAS was 6.7 (6.3-7.2) in CRS with polyp and 6.9 (6.3-7.4) in CRS without nasal polyp but different from that of the study by De Conde et al.,[21] were mean VAS pre-operatively in CRS with nasal polyp and without polyp was 3.6±2.5 and 3.6± 2.5, respectively.

In our study, after Endoscopic Sinus Surgery (ESS), the mean SNOT 22 score in CRS with nasal polyp is 13.1±14.9 and without nasal polyp is 11.9±12 (12 weeks post-operatively). The study conducted by Hopkins et al (2009), 3 month postoperative mean of SNOT 22 in CRS with nasal polyp and CRS without nasal polyp was 23.1 ±19.5 and 31.3±22.5 respectively.[16]

Post-operative mean VAS in CRS with nasal polyp and CRS without nasal polyp is 2.5±1.8 and 2.6±1.5, respectively. The finding correlates with the study by Johnson et al.[20] were post-operative mean VAS was 3.4 (2.7-4.0) in CRS nasal polyp patient and 3.6 (2.8-4.4) CRS without polyp patient.

Conclusion

This study was conducted with the aim of assessment of the outcome of endoscopic sinus surgery in chronic sinusitis and chronic rhinitis patient with nasal polyp and without polyp non responsive to medical treatment.

There is significant improvement in the Quality of Life (QOL) in both chronic sinusitis and chronic rhinitis with nasal polyp and without nasal polyp patients after Endoscopic sinus surgery (ESS).

To conclude, the present study presents an impression that in patients with CRS non- responsive to medical treatment, the decision for surgery should be guided by their pre-operative QOL impairment, as measured by SNOT 22 and VAS.

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