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Main Article

Evaluation of endoscopic sinus surgery by Glasgow benefit inventory

J R Newton, M Shakeel, B Ram

Abstract

Introduction: Functional endoscopic sinus surgery is a common adjunct to medical therapy in cases of chronic rhinosinusitis and nasal polyposis.

Aim: The objective of this study was to assess patients' quality of life up to two years after endoscopic sinus surgery.

Method: Fifty consecutive patients attending a rhinology clinic filled in the Glasgow benefit inventory. The patients were divided into three groups according to the time period elapsed since surgery (i.e. six months, 12 months or up to two years).

Results: The results showed that, generally, the Glasgow benefit inventory scores indicated a benefit from the procedure. Overall, surgery led to statistically significant improvements in both total and general scores ($p < 0.05$). Comparison of endoscopic sinus surgery with nasal polypectomy (plus endoscopic sinus surgery) indicated a greater benefit for polyp disease. No statistical difference was observed between the scores for females *vs* males or for various post-operative follow-up periods.

Key words: Endoscopy; Humans; Nasal Polyps; Nose Diseases; Paranasal Sinus Diseases; Paranasal Sinuses; Patient Satisfaction

Introduction

Chronic rhinosinusitis is a common disorder and is one of the most common reasons for patients to seek help from a physician.[1] It is associated with considerable morbidity and has enormous social and economic sequelae.[2]

Endoscopic sinus surgery (ESS) was introduced by Messerklinger[3] in the late 1970s. Over the past three decades, it has gained acceptance for the treatment of symptoms of rhinosinusitis[4–6] refractory to medical treatment. Endoscopic sinus surgery is one of the most commonly performed operations in otolaryngology, with more than 200 000 procedures performed each year in the USA.[7]

In today's climate of evidence-based medicine and impending revalidation, surgeons are required to constantly review practice and to assess the impact of treatments. In 1996, Robinson and colleagues[8] devised the Glasgow benefit inventory. This is a validated, 18-item, post-interventional questionnaire developed especially for otolaryngological interventions, and is a measure of patient benefit resulting from healthcare intervention. The Glasgow benefit inventory has been used[9–12] to quantify changes in patients' quality of life after various otolaryngological interventions.

The aim of this study was to measure patients' overall perceived benefit after ESS, using the Glasgow benefit inventory.

Materials and methods

Fifty consecutive patients attending their follow-up appointment at our ENT out-patient clinic between July and September 2006 were asked to fill in the Glasgow benefit inventory questionnaire. Patients' age, sex, procedure and time elapsed since surgery were recorded. The post-operative period was classified into three groups: under six months, seven to 12 months or more than 12 months. All the operations were performed under the supervision of one surgeon. Patients who underwent unilateral ESS, septoplasty, turbinate surgery or any procedure other than simple ESS with or without nasal polypectomy were excluded from the study. Post-operatively, all patients were prescribed intranasal steroids and saline douches for two to three months. Data from the completed Glasgow benefit inventory questionnaires were collected using Windows Excel software and were scored as advised by Robinson *et al.* Data were analysed by a medical statistician using the Statistical Package for the Social

From the Department of Otolaryngology, Aberdeen Royal Infirmary, Aberdeen, Scotland, UK.
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Sciences software (version 14; SPPS, Chicago, Illinois, USA), applying the Mann–Whitney U test for non-parametric data.

Results and analysis

The questionnaire was completed by 50 consecutive patients who had undergone ESS with or without nasal polypectomy and who fitted our criteria. The Glasgow benefit inventory scores for all four scales ranged from −100 to 100, with any positive score indicating an improvement in general health status.

The average age of our patients at the time of the study was 54 years (range 19–73). Twenty-four men and 26 women completed the questionnaire. Thirty-one patients had undergone ESS alone and 19 patients had undergone ESS plus nasal polypectomy. The mean follow-up period was 13 months (range four to 24 months).

For the total cohort of 50 patients, the median total Glasgow benefit inventory score was 25.0 (interquartile range 10.4–36.8). The median general Glasgow benefit inventory score was 29.2 (interquartile range 12.5–45.8). The median social Glasgow benefit inventory score was zero (interquartile range zero to 16.7). The median physical Glasgow benefit inventory score was 16.7 (interquartile range zero to 37.5). These results are illustrated in Figure 1.

We compared the group of patients who had undergone ESS plus polypectomy with those who had undergone ESS alone (Figure 2). The median total score was 30.6 (interquartile range 22.2–50) for the polypectomy group and 22.2 (interquartile range 8.3–33.3) for the ESS group. This difference was statistically significant ($p = 0.031$). The median general score was 37.5 (interquartile range 20.8–58.3) for the polyposis group and 25 (interquartile range 4.2–41.6) for the ESS group. Again, this difference was statistically significant ($p = 0.029$). For the social score sub-scale, the medians of both groups were zero (polyposis interquartile range zero to 33.3, ESS interquartile range zero to 16.7), so no statistically significant difference was present ($p = 0.398$). However, the increased interquartile range for the polypectomy group did indicate overall benefit for this cohort. The median physical scores were 33.33 (interquartile range zero to 50) for the polyposis group and zero (interquartile range zero to 33.3) for the ESS group. Again, while this difference was not statistically significant ($p = 0.093$), the interquartile ranges indicated an overall benefit for the polyposis group.

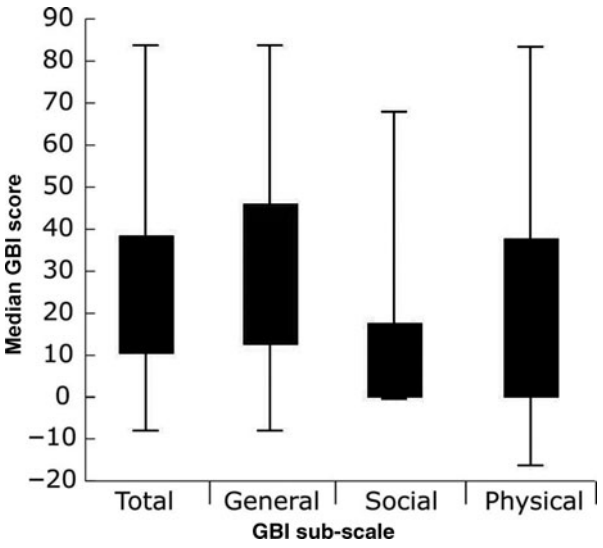

FIG. 1
Median Glasgow benefit inventory (GBI) scores for all 50 patients.

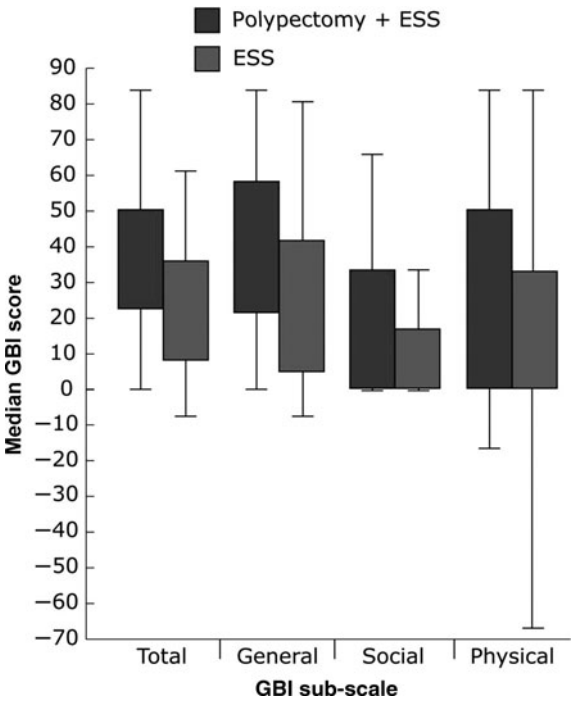

FIG. 2
Median Glasgow benefit inventory (GBI) scores for polypectomy plus endoscopic sinus surgery (ESS) *vs* ESS alone.

The scores for men *vs* women are summarised in Figure 3. For men, the median sub-scale scores were: total 25 (interquartile range 8.33–36.11); general 25 (interquartile range 8.33–45.83); social zero (interquartile range zero to 33.33) and physical 16.67 (interquartile range zero to 33.33). The same scores for women were: total 27.78 (interquartile range 13.89–38.89); general 33.33 (interquartile range 16.67–45.83); social zero (interquartile range zero to 16.67) and physical 16.67 (0–50). None of the GBI sub-scale scores showed a statistically significant difference comparing the scores for males against females (p values of 0.645, 0.489, 0.923 and 0.4950, respective to the above sub-scales).

The Glasgow benefit inventory sub-scale scores for the three different post-operative periods (i.e. up to six months, six to 12 months and up to 24 months) are listed in Figure 4. The median sub-scale scores for the six month group were: total 30.56 (interquartile range 8.33–38.19); general 33.33 (interquartile range 9.38–45.83); social zero (interquartile range zero to 12.50) and physical 16.67 (interquartile range zero to

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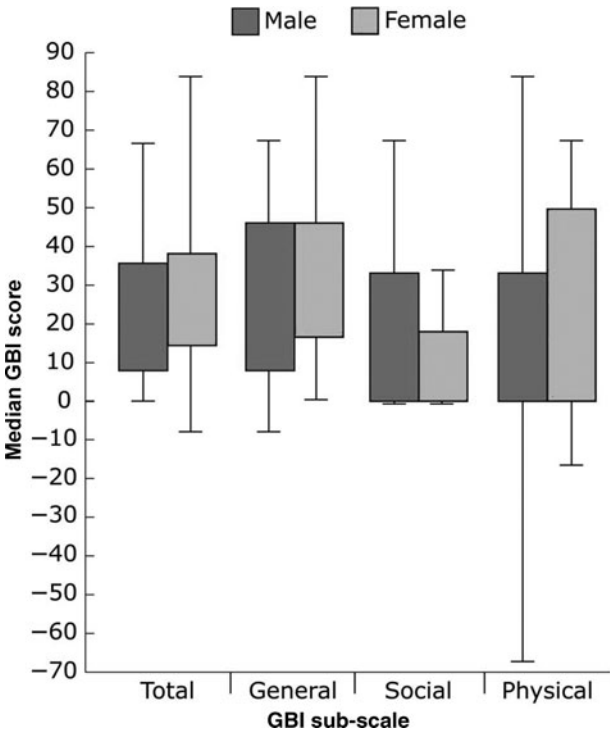

FIG. 3
Median Glasgow benefit inventory (GBI) scores for males *vs* females.

45.83). The median sub-scale scores for the 12 month group were: total 23.61 (interquartile range 9.03–41.67); general 25 (interquartile range 11.46–48.96); social zero (interquartile range zero to 20.83) and physical 16.67 (interquartile range −16.67–50.00). The median sub-scale scores for the 24 month group were: total 23.61 (interquartile range 11.81–32.64); general 22.92 (interquartile range 16.67–41.67); social zero (interquartile range zero to 33.33) and physical 16.67 (interquartile range zero to 16.67).

The median Glasgow benefit inventory sub-scale scores from the three different post-operative periods were compared using the Kruskal–Wallis test. There were no significant differences between post-operative periods for total score ($p = 0.88$), general score ($p = 0.85$), social score ($p = 0.85$) and physical score ($p = 0.70$).

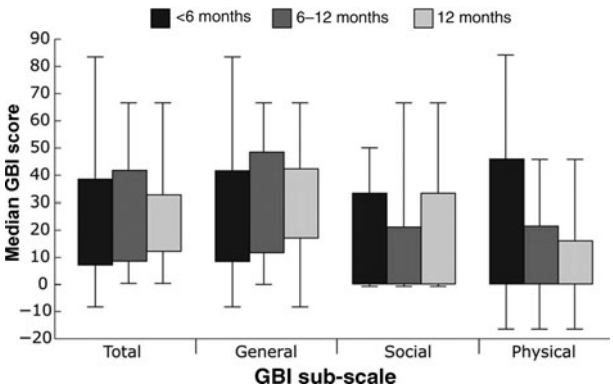

FIG. 4
Median Glasgow benefit inventory (GBI) scores for the three post-operative follow-up periods (i.e. <6 months, 6–12 months and up to 2 years).

Discussion

Chronic rhinosinusitis is a complex, multi-factorial disorder with a group of diverse symptoms, such as nasal obstruction, headache, postnasal drip and hyposmia. Aetiological factors include both obstructive elements (e.g. osteomeatal complex) and non-obstructive mechanisms (e.g. allergy, genetic predisposition, inflammation and environmental pollutants). Surgical interventions such as ESS target obstructive elements, but more research is still required into non-obstructive elements before the disease can be truly cured. Until then, the treatment goal should be reduction of symptoms, leading to an improvement in the patients' psychological, social and physical wellbeing.[8]

This study used the Glasgow benefit inventory because of its validated sensitivity in detecting benefit after various otolaryngological procedures. It comprises 18 questions and can be completed by most subjects in around five minutes. Each question response is scored from one to five, with one representing a large deterioration in status and five a significant improvement. To avoid response bias, half of the answers range from a large improvement to a large deterioration, and the other half vice versa. As shown in Figures 1 to 4, the Glasgow benefit inventory includes three sub-scales, with 12 questions for general health, three for social health and three for physical health. This provides additional information on the nature of the health change experienced.

- **Chronic rhinosinusitis is a complex, multi-factorial disorder**
- **Endoscopic sinus surgery is a common adjunct to medical therapy in cases of chronic rhinosinusitis and nasal polyposis**
- **The Glasgow benefit inventory has been validated for detection of benefit from otolaryngological procedures**
- **Endoscopic sinus surgery results in overall general and health benefits in patients with rhinosinusitis**
- **These benefits are immediate and sustained for up to at least two years**

Our results clearly show that ESS with or without polypectomy was successful in achieving overall benefit. Patients reported differing perceived benefits for all sub-scales; however, this finding was not surprising, given that the Glasgow benefit inventory is a subjective assessment tool. Patients' overall perceived benefit is illustrated in Figure 1. These findings are in keeping with previous similar studies.[9,10] However, our study found higher Glasgow benefit inventory scores for all four sub-scales. The likely

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reason for this was the shorter overall post-operative follow-up period for our patient cohort.

The Glasgow benefit inventory scores showed a greater benefit for ESS plus polypectomy compared with ESS alone. Statistical significance was achieved for total and general scores. Physical and social scores showed greater benefit for the ESS plus polypectomy group compared with the ESS group alone but this did not reach statistical significance. The most likely reason for the overall improvement was the surgical removal of polyposis, with its obvious obstructive effect, resulting in immediate relief, compared with the less immediate benefit in sinusitis patients.

Unsurprisingly, there was no significant difference between men and women in terms of overall benefit.

Figure 4 shows the results for the three post-operative follow-up periods. There were no statistically significant differences between any of these groups for any of the Glasgow benefit inventory sub-scales. This indicates that the benefits of ESS appear to be immediate and sustained.

Conclusion

Overall, this study validated ESS, as it showed that this procedure resulted in an improvement in patients' general and physical health.

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Address for correspondence:
Mr Jonathan R Newton,
17 Queens Avenue, Aberdeen AB15 6WA,
Scotland, UK.

E-mail: jnewton59@hotmail.com

Mr J R Newton takes responsibility for the integrity of the content of the paper.
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