

Research Article

The Effectiveness of the Use of Pre CT Paranasal Sinuses Request Checklist in the Management of CRS

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Abstract

Objective: A study to evaluate the effectiveness of the use of pre CT checklist in requesting CT paranasal sinuses for managing patients with Chronic Rhinosinusitis (CRS).

Place and Duration: CT sinuses performed at Aberdeen Royal Infirmary from 20 Aug 2010 to 3rd Nov 2010 after the introduction of pre CT paranasal sinus request checklist.

Methods: Prospective studies of patients undergoing CT paranasal sinuses for complaints of CRS were included in this study. This was in fact a re-audit based on the recommendations by the original audit done in 2007 to reduce the number of normal CT paranasal sinuses being requested in view of the recommendations of the European Position Paper on Sinusitis (EPOS Document 2007).

Results: A total of 83 CT Sinus scans had been performed, however, 17 patients were excluded from the study due to incomplete data or previous sinus surgery. 20 patients who had their pre CT checklist completed (Group 1) and 46 patients in whom the pre CT checklist was not completed (Group 2) were included in this study. The mean Lund Mackay Score in group 1 was 7.7 as compared to 3.45 in group 2. This was found to be statistically significant ($p=0.0160$). In Group 1, 9 (45%) out of 20 patients and in group 2, 10 (22%) out of 46 patients underwent endoscopic sinus surgery.

Conclusion: These findings show that with the use of pre CT checklist in requesting CT paranasal Sinuses for CRS does show higher rate of positive sino-nasal pathology on CT paranasal sinuses, thus reducing the number of normal scans, negative endoscopic sinus surgeries and unnecessary radiation exposure.

ETHICAL APPROVAL

The local care quality commission at Aberdeen Royal Infirmary approved this study.

INTRODUCTION

Chronic Rhinosinusitis (CRS) is one of the most common health care problems with significant impact on patients' general health [1-3]. Patients present to the otorhinolaryngologist with various symptoms, including post nasal drip, rhinorrhoea or blocked nose, itchiness of eyes and nose, anosmia, headaches and facial pains [4-5]. The diagnosis is clinical (including nasal endoscopy) and the treatment primarily medical. Only when intensive medical treatment, consisting of oral antihistamines, nasal steroid sprays and oral steroids, fails, should operative treatment be considered [6]. CT scan of the paranasal sinuses should be

an adjunct to establish the sinus anatomy pre-operatively but not for diagnosing the disease [6-7]. The correlation between patient symptoms and CT findings is poor and the prevalence of incidental mucosal changes in an asymptomatic population is approximately 30% [7].

The European Position paper on Sinusitis (EPOS Document 2007) has provided the Otorhinolaryngologists as well as general practitioners clear practice guidelines in managing patients with acute as well as chronic rhino sinusitis. The guidelines provide a clear definition for the diagnostic criteria for chronic rhinosinusitis. It also advocates the use of CT scan only if maximal medical therapy has failed and when sinus surgery is planned in simple chronic rhinosinusitis.

The original audit was a retrospective review of CT paranasal

sinuses scans at Aberdeen Royal Infirmary in 2007 to evaluate the use of CT paranasal sinuses in the management of chronic rhinosinusitis. The audit suggested that CT paranasal sinuses were being requested for diagnostic reasons as only 54 % of the patients who had CT paranasal sinuses requested underwent endoscopic sinus surgery. The audit also showed that only 24 % of the patient included in the study received maximal medical therapy for CRS.

Based on the recommendations of the original audit a pre-request CT Para nasal sinus check list was introduced to assist in the process of booking a CT paranasal sinus scan and to emphasise the importance of preoperative medical management prior to the use of imaging in the management of patients with CRS (Figure 1).

The aim of this audit was to evaluate the impact of the checklist on the decision making process and to reduce the number of unnecessary normal CT paranasal sinuses scans being requested in our hospital trust when considering CT paranasal sinuses in the management of CRS.

MATERIAL AND METHODS

This study was a prospective review of CT paranasal sinuses performed at Aberdeen Royal Infirmary from 20 Aug 2010 to 3rd Nov 2010 following the introduction of pre CT questionnaire on the 1st of Aug 2010.

Inclusion criteria

All patients undergoing CT Sinuses for CRS requested by the ENT department.

Exclusion criteria

Patients with previous sinus surgery, suspected unilateral

pathology (neoplasia). We designed a checklist including data on diagnostic criteria for CRS and appropriate medical management as per EPOS guidelines. This form was completed by the ENT doctor when a CT scan of paranasal sinuses was considered. The check list required clinicians to answer 4 queries, namely:

1. Is the diagnosis chronic rhinosinusitis?
2. Is there positive endoscopic findings?
3. Is the scan for pre-operative planning for endoscopic sinus surgery?
4. Has the patient had maximal medical therapy?

Data for this study was collected from the formal paranasal sinus CT reports and the pre CT request checklist.

Statistical analysis was performed using Graph Pad Prism (version 5; Graphpad Software, Inc. La Jolla, San Diego) at significance level of 5%. Comparison between groups was done using Mann-Whitney tests.

All the CT Scans were graded using the Lund McKay grading system for CT Sinuses [8].

RESULTS

A total of 83 CT Sinus scans were performed with majority for patients with CRS. Of those only 27 pre CT forms were completed. 17 patients were excluded from the study as 13 of them had previous sinus surgery, 1 patient had an oro-antral fistula while 3 patients had incomplete data. The patients were divided into two groups based on the completion of checklist prior to CT paranasal sinus request, 20 patients who had their pre CT forms completed were termed as Group 1 and 46 patients in whom the

Pre CT Paranasal Sinus checklist in Chronic Rhino-Sinusitis (CRS) (uncomplicated)

1. CRS ¹	Yes	No
2. Positive Endoscopic findings? ²	Yes	No
3. Preoperative Planning for ESS	Yes	No
4. Has patient had Maximal Medical Therapy? ³	Yes	No

¹ EPOS Definition for CRS: Inflammation of the nose and the Para nasal sinuses characterized by two or more symptoms, one of which should be

Nasal blockage/obstruction/congestion or nasal discharge (anterior/posterior nasal drip):

± Facial pain/pressure

± Reduction or loss of smell

Lasting for > 12 weeks without complete resolution of symptoms

² Endoscopic signs of:

- Polyps and/or

- Mucopurulent discharge primarily from middle meatus and/or

- Oedema/mucosal obstruction primarily in middle meatus

³ Includes topical and/or oral steroids, nasal douching, oral antihistamines in allergy, oral antibiotics long term > 12 weeks for late relapse

EPOS: European Position Paper on Rhino sinusitis and Nasal Polyps 2007

Proceed to CT scan only if maximal medical therapy unsuccessful AND operation is planned

Figure 1 Pre paranasal sinus CT request checklist.

pre CT questionnaire was not completed were classed as Group 2 in this study.

In Group 1, with completed checklist, 5 (25%) showed normal sinuses, 3 (15%) showed mild sinus disease, 4 (20%) showed moderate and 8 (40%) showed severe sinus disease (Table 1).

In Group 2, where the pre CT questionnaire was not completed, 22 (48%) showed normal sinuses, 12 (26%) showed mild sinus disease, 4 (9%) moderate and 8 (17%) showed severe sinus disease.

The average Lund Mackay Score in group 1 was 7.7 as compared to 3.45 in group 2, this was found to be statistically significant ($p = 0.0160$) (Figure 2).

In Group 1, 9 (45%) out of 20 patients underwent Endoscopic Sinus surgery, while in group 2, 10 (22%) out of 46 patients underwent Endoscopic Sinus surgery. However, there was not significant difference found in surgeries performed ($p = 0.077$), this is most likely due to the small cohort.

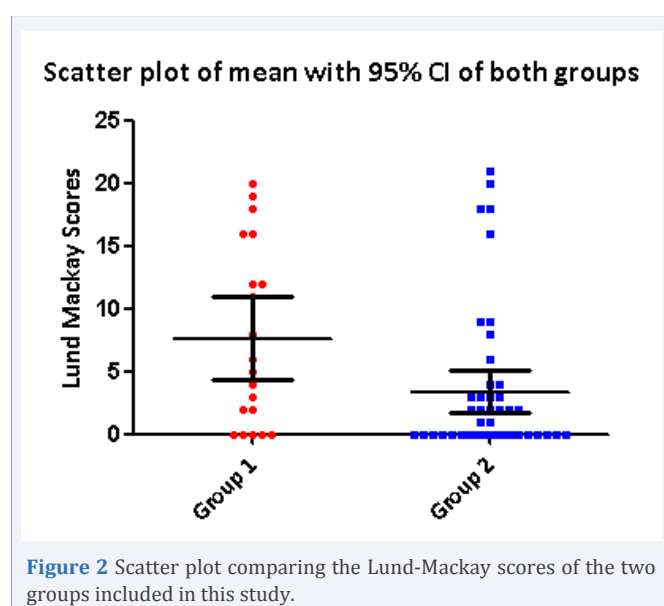
LIMITATIONS

The CT scan results were not reported according to the Lund-Mackay or any other validated scoring system, but rather expressing mild, moderate or severe pacification of separate sinuses. From these reports an average Lund-Mackay score was derived by the authors. The investigator reading the reports was blinded to the outcome of the Lund-Mackay score.

Also the medical management details of the patients in group 2 where no checklist was completed could not be ascertained due to unavailability of data as clinical notes were not included in this re audit.

Table 1: Comparison of sinus disease on CT reports between the two groups.

	Normal	Mild	Moderate	Severe
Group 1 (n = 20)	5 (25%)	3 (15%)	4 (20%)	8 (40%)
Group 2 (n = 46)	22 (48%)	12 (26%)	4 (9%)	8 (17%)



DISCUSSION

Chronic Rhinosinusitis (CRS) is a common disorder with significant impact on patients' life. CRS has the second highest prevalence amongst all chronic conditions, the most prevalent being deformities of orthopaedic impairment [9].

Symptoms include post nasal drip, rhinorrhoea or blocked nose, itchiness of eyes and nose, anosmia headaches and facial pains [10,11].

The medical treatment of CRS consists of a variety of topical and systemic agents (topical nasal steroid sprays, antibiotics and decongestants) with surgical options if intensive medical treatment fails [3-6].

To date the authors could not come across a placebo-controlled studies into the efficacy of short-term antibiotics in CRS, but there might be positive effects in long-term use of low dose macrolide treatment [3,12]. The mainstay of medical management remains treatment with topical nasal steroid sprays. A course of oral steroids can be useful in severe, refractory cases, particularly in the presence of allergy [3]. To bridge this therapeutic gap, an intermediate dose of steroid, such as betamethasone drops or fluticasone nasules can be helpful [13]. Various other medical forms of treatment have been administered for CRS, including antihistamines, antimycotics, mucolytic agents and immunomodulators but there is currently little evidence to support their use in CRS [3,13].

CT scanning is the imaging modality of choice for chronic rhinosinusitis to confirm the surgically relevant anatomy as well as the extent of the pathology. Approximately 30% of asymptomatic individuals have findings of mucosal changes on CT [7]. CT scans of the paranasal sinuses have been shown to correlate poorly with surgical findings [14], as well as with patients' symptom [15,16].

Thus various authors do not recommend CT scanning to be the primary step in diagnosis, but rather an extended examination after failure of medical therapy and mainly for planning of surgical intervention [6,15].

Various CT staging systems exist, but the Lund-Mackay system has been well validated. It consists of a score of 0-1-2 for each sinus and the osteomeatal complex on each side, depending on absent, partial or complete pacification of the structure, thus deriving a maximal score of 12 per side [8]. This system is widely accepted and used.

CONCLUSION

The findings of this study show that the use of pre CT questionnaire does show higher rate of positive Sino-nasal pathology on CT, thus reducing the number of normal scans being requested, negative endoscopic sinus surgeries and unnecessary radiation exposure.

Even with the introduction of pre CT questionnaire, there are still a number of CT sinuses being requested with normal sinuses being reported, this may be due to lack of clinician compliance with the checklist.

This audit highlights the need for stricter implementation

and compliance with EPOS guidelines to reduce the number of negative CT paranasal sinuses being requested.

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Conflict of interest statement

There is no conflict of interest in this study.

None of the authors have any financial and personal relationships with other people or organizations that could inappropriately influence (bias) their work

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