Patient experience surrounding bronchoscopy

Bronhoscopia – experiența pacientului

Richard Bodington MBBS[1], Salim Meghjee MBBS[2], Muthu Thirumaran MBBS[2], Shoaib Faruqi MD[3]

1. University Hospitals Coventry and Warwickshire NHS Trust, Department of Gerontology, United Kingdom

2. Mid Yorkshire NHS Trust, Department of Respiratory Medicine, United Kingdom

3. Hull and East Yorkshire Hospitals NHS Trust, Department of Respiratory Medicine, Hull, United Kingdom

Corresponding author:
Richard Bodington
University Hospital Coventry, Clifford Bridge Road, Coventry, West Midlands
Email: r.bodington@nhs.net

Abstract

Fiberoptic bronchoscopy (FOB) is a commonly performed procedure in thoracic medicine associated with significant discomfort, which greatly impacts patient satisfaction with the procedure. The UK DoH and BTS stress the benefits of collecting and reviewing patient experiences of a service and how this information should shape service provision. In this current study we assess a number of tolerance and satisfaction related factors in 108 consecutive patients undergoing FOB. We demonstrate a highly significant relationship between patient reported comfort and complete amnesia of FOB. We fail to demonstrate a relationship between patient reported comfort during FOB and the bronchoscopist's assessment of tolerance. We also suggest a relationship between poorer patient reported comfort and a lower WHO performance status. The identification of factors associated with satisfaction with FOB will allow creation of strategies to improve patient experience and lead to better outcomes.

Keywords: ***Bronchoscopy, patient satisfaction, patient comfort, questionnaire.***

Rezumat

Bronhoscopia cu fibra optică (FOB) este o procedură frecvent efectuată în medicina toracică, asociată cu un disconfort semnificativ care are un impact foarte mare asupra satisfacției pacientului legată de procedură. DOH si BTS din Marea Britanie subliniază beneficiile colectării și revizuirea experiențelor pacienților unui serviciu și modul în care acest lucru ar trebui să modeleze furnizarea de servicii. În cadrul acestui studiu, evaluăm un număr de factori de toleranță și de satisfacție la 108 pacienți consecutivi care au suferit FOB. Am demonstrat o relație foarte semnificativă între confortul raportat de pacient și amnezia totală din timpul FOB. Nu am reușit să demonstrăm o relație între confortul raportat de pacient în timpul FOB și evaluarea toleranței de către bronhoscopist. De asemenea, sugerăm o relație între confortul scăzut raportat de pacient și un status de performanță OMS mai redus. Identificarea factorilor asociați cu satisfacția din timpul FOB va permite crearea de strategii care să îmbunătățească experiența pacientului și să conducă la rezultate mai bune.

Cuvinte-cheie: ***bronhoscopie, satisfacția pacientului, confortul pacientului, chestionar.***

This study was approved by the Mid Yorkshire Hospitals NHS Trust audit committee. The authors declare no conflicts of interest.

Introduction

Fiberoptic bronchoscopy (FOB) is a commonly performed procedure in thoracic medicine. The procedure was first introduced in 1968 and its use has been refined so that it is associated with few serious adverse events[(1)]. However, FOB is associated with significant dysphagia, nose and throat pain, and fear, which greatly impact patient satisfaction with the procedure. The UK Department of Health stresses in their guidance the numerous benefits of collecting and reviewing patient experiences of a service and how this information should be the basis for shaping service provision[(2)]. The importance of studying and acting upon the factors that affect patient satisfaction with FOB are also prominent in the British Thoracic Society (BTS) bronchoscopy guidelines[(3)]. Indeed, patient satisfaction itself is a valid healthcare provision outcome measure. Despite this, relatively little research has gone into the investigation of factors that affect patient satisfaction with bronchoscopy. These factors can be broadly broken down into patient characteristics, patient previous experience with healthcare, patient expectations, and care during and after the procedure itself[(3)]. Indicators of patient satisfaction may be assessed in a variety of ways and include patient willingness to return for repeat procedure, rating using a visual analogue scale (VAS), adherence to post procedure instructions or the recorded number of complaints or claims made against a unit[(3)]. Previous studies have identified a number of factors associated with improved patient satisfaction with FOB and these are summarized in table 1.

The identification of factors associated with better or worse satisfaction with FOB will allow targeted strategies to be put in place to improve patient satisfaction and therefore lead to better outcomes[(1)]. These outcomes include enhanced patient satisfaction, a better doctor-patient relationship, improved willingness to return for care and adhere to discharge plans as well as a reduction in number of complaints[(1)].

The aim of this study was to look at factors which might predict patient tolerance to FOB as there is a paucity of data on the factors associated with better patient tolerance. In this current study we assessed a number of doctor and patient reported tolerance and satisfaction related factors in patients undergoing FOB in a UK NHS Trust.

Methods

The study sample was derived from consecutive patients undergoing FOB at the Mid Yorkshire Hospitals NHS Trust. Patients aged over 18 years of age were eligible to participate in the study. Informed consent was obtained. Structured questionnaires were used to collect data from the patients undergoing elective FOB and

Table 1 Factors previously demonstrated to be associated with improved patient satisfaction with FOB

Study	Objective factors	Patient reported factors	Numbers	Methodology
Lechtzin et al. 2002[1]	-Better general health status	-Less pain experienced -Rated information given pre-procedure better -Rated quality of bronchoscopist higher	481	Prospective cohort study
Hirose et al. 2008[4]	-Male gender -Shorter procedure time -More experienced bronchoscopist	-Less discomfort from coughing -Less pharyngeal pain -Less odynophagia	129	Prospective cohort study
Hadzri et al. 2010[5]	-Lower total number of coughs	-Lower cough perception	60	Cross-sectional, observational study with convenience sampling
Bernasconi et al. 2009[6]	-Shorter procedure time		126	Prospective cohort study

the physicians performing it. Both questionnaires included tolerance scores of 1 to 5, with 5 being very satisfied/very well tolerated (Likerts scale). The patient questionnaire included satisfaction with scope insertion, local anaesthetic spray, comfort, waiting times, information provided and the care provided by doctors and nurses before, during and after the procedure. Other fields such as symptoms experienced, amount remembered and whether the patient would return for a repeat procedure were also included. A separate questionnaire filled out by the bronchoscopist also included a similar Likerts scale for tolerance as well as objective measures of performance status, route of intubation, samplings done and amount of Midazolam used.

Patients participating in the study were requested to complete and post the questionnaire the day after the procedure and the physician performing the FOB filled in the questionnaire immediately after the procedure. The study was approved by the Mid Yorkshire Hospitals NHS Trust audit committee. Data was analysed using Microsoft Excel 2010. Regression analysis was used for the majority relationships between data groups with Spearman's correlation coefficient used in other queries as specified in the results. The Mann-Whitney U test was used for binary data fields.

Results

Two hundred patients agreed to participate in the study and 108 returned the questionnaire giving a response rate of 54%. The sample comprised of 54.6% males with the vast majority being over the age of 55 years. Data from the patient returned questionnaires was analysed.

The bronchoscope was inserted nasally in 76.9% of cases and supplementary oxygen given in 59.3% of cases. Table 2 displays these and other patient characteristics. In terms of the consent process 93.5% of patients received an information leaflet prior to the procedure and 54.6% of patients were very satisfied with the contents of this leaflet with 38.9% satisfied. 48.1% of patients were very satisfied with the amount of time they were given to consider their consent and 50% were satisfied. 95.4% felt they had the opportunity to ask questions prior to the procedure.

Table 2 Patient demographics

Characteristics	N=108
Gender	Male (54.6%) Female (45.4%)
Age	18-40 (8.3%) 41-45 (1.9%) 46-50 (3.7%) 51-55 (5.6%) 56-60 (19.4%) 61-65 (9.3%) 66-70 (12%) >70 (39.8%)
Performance status	0 (37%) 1 (38.8%) 2 (18.5%) 3 (5.6%) 4 (0%)
First bronchoscopy	Yes (81.5%) No (18.5%)
Route of scope insertion	Nasal (76.9%) Oral (23.1%)
Supplemental oxygen given	Yes (59.3%) No (40.7%)
Received information leaflet	Yes (93.5%) No (6.5%)

The mean patient comfort score during bronchoscopy using the Likert scale (5= very comfortable/ very satisfied) was 3.86 and the mode was 4 (35% of patients). Mean satisfaction with sedation was 4.22 with a mode of 5 (51.9% of patients) with complete amnesia reported by 16.7% of patients. Satisfaction with scope insertion was very similar (mean 4.56, mode 5). The bron-

Table 3 Summary of the results of regression analysis.

Fields analysed via regression	Results
Performance status vs. patient's reported comfort	R^2 0.034 p 0.058
Age vs. patient's reported comfort	R^2 0.009 p 0.333
Patient's reported comfort vs. composite care score	R^2 0.0008 p 0.765
Dose midazolam given (in mg) vs. bronchoscopist assessed patient tolerance	R^2 0.023 p 0.119
Dose midazolam given (in mg) vs. patient's reported comfort	R^2 0.004 p 0.51
Dose midazolam (in mg) vs. amount of procedure remembered by patient	R^2 0.003 p 0.569

choscopist's assessment of patient tolerance yielded similar results with mean tolerance of 3.82 and mode of 5 (5= very well tolerated). The mean and mode time for patients to feeling back their normal selves was 2 hours with a mean of 5.5 hours.

The main results of regression analysis are summarised in table 3. A trend towards better patient tolerance with improved WHO performance status was observed (p 0.058). No parameters impacted significantly on patient comfort. In particular, there seemed to be no relationship between the dose of Midazolam and patient reported, or indeed bronchoscopist reported, comfort. The mean dose of Midazolam given to patients reporting complete amnesia was higher than that given to patients who retained some memory of the procedure (3.12 vs. 2.86 respectively). Patient comfort in patients reporting complete amnesia against those with some memory of the procedure revealed a highly significant improvement in the amnesic group (p <0.001).

The route of FOB insertion (nasal vs. oral) was found to have no significant relationship with satisfaction with scope insertion, patient comfort or bronchoscopist reported tolerance (p= 0.395, 0.478, 0.826 respectively). The mean patient reported comfort with oral intubation was slightly better than with nasal (4.04 vs. 3.83 respectively).

There was no significant correlation observed between doctor and patient reported comfort/tolerance (Spearman's rank: R 0.046, two-tailed P 0.636). This remained the case even after patients who reported complete amnesia were excluded (R 0.044, two-tailed P 0.678).

The mean composite satisfaction with nursing care score (average of the score for care before, during and after the procedure) was 1.24 (1= very satisfied, 4= very unsatisfied) while the composite score for care by doctors was 1.29. The composite nursing and doctor care scores were averaged to give a single score broadly representative of all care given. No significant relationship was found between patient reported comfort and this score (R2 0.0008, significance F 0.765). Of the 108 patients sampled only four indicated that they would not return for a repeat FOB if it were necessary and due to this small sample size formal statistical analysis could not be undertaken.

Discussion

Our study describes a population of patients who are predominantly elderly with good performance statuses who tolerate FOB well, both as assessed by themselves and by the performing bronchoscopist. Our study suggests a relationship between poorer patient reported comfort and a lower WHO performance status, which narrowly failed to reach significance. This finding is very much in keeping with the literature where poor performance status is significantly related to poor tolerance and conversely excellent health associated with improved pain perception in FOB (1;7). Such findings suggest that bronchoscopists should expect poorer tolerance in lower performance status patients and should therefore proactively address issues prior to undertaking the procedure.

Our study demonstrated that patient reported comfort was significantly improved in the group of patients who reported no memory of the procedure when compared to those who reported some memory (1 on a 5 point scale where 1= I remember nothing 5= everything). Unsurprisingly, our data did suggest that patients' reporting complete amnesia received a slightly higher dose of Midazolam. Contrary to what one might expect our study failed to demonstrate a significant correlation between the dose of Midazolam given and the amount of the procedure remembered outside of complete amnesia. Furthermore, the effect did not seem to translate into improved tolerance as assessed by the bronchoscopist or the patient outside of complete amnesia. In fact, the data suggests a non-significant trend towards worse tolerance with higher doses of Midazolam. It may of course be argued that this is due to doctors administering more Midazolam to less tolerant patients in an effort to ameliorate their symptoms. Our findings appear to agree with previous studies that have shown that improved pain control in FOB is associated with no memory of the procedure, although it should be noted that the outcomes are not directly comparable (7).

In this current study we have failed to demonstrate a significant relationship between patient reported comfort during FOB and the bronchoscopist's assessment of patient tolerance. Several previous studies have reported similar findings (8). In these studies bronchoscopists were unable to accurately assess levels of anxiety and fear in their patients and consistently underestimated patient's tolerance (8-11). One study by Hadzri and colleagues demonstrated a significant correlation between doctor and patient perception of cough as rated via a visual analogue scale but failed to demonstrate a significant correlation between doctor and patient assess-

ment of overall satisfaction or sensation of choking or vomiting (5). The authors suggested that this may be due to the bronchoscopist's attention being focused on the scope's display, which often results in them relying on sound only as a marker of the patient's well-being. This finding, supported by our own findings, suggests that nursing staff in the bronchoscopy room have a key role to play in detecting non-auditory signs of patient distress and alerting the bronchoscopist when appropriate. Indeed, as suggested by earlier studies nurses' assessments of patient tolerance of FOB may yield some interesting results (5).

The patients in our study were generally satisfied with the information given them prior to the procedure (93.5% satisfied or very satisfied), the time taken to consider their consent (98.1% satisfied or very satisfied) and the opportunity to ask questions (93.5% reported they had the opportunity). Our patients were also generally very satisfied with the care given them by nurses and doctors and 96.3% of patients would return for a repeat FOB if necessary. Studies have demonstrated that detailed pre-procedure explanation of 'how and why' the procedure is performed reduced pre-procedure fear in patients (12). Discomfort during bronchoscopy has been shown to correlate with a patient's anxiety before the procedure (6;13). Our data suggests concurrence with this finding as we demonstrated a trend of a higher perception of care provided with improved tolerance of FOB that approached significance. We failed to demonstrate a significant relationship between perception of care and patient reported comfort during FOB. Previous studies have demonstrated that patients who rated the information given them prior to FOB highly, reported improved pain control during the procedure compared to those who rated the information lower (7). Therefore, thorough explanation of the procedure may well be an effective method of improving patient tolerance of FOB, especially in patients who are likely to be less tolerant. The association between higher quality information and improved patient satisfaction has been demonstrated in a variety of settings such as A&E, oncology outpatient clinics, asthma care and during GI procedures (1).

There are several limitations to the current study. As applicable to all studies of this kind, there may be a confounding effect of those patients who respond compared to those who do not. The parameters used to assess patient comfort also necessarily have to be subjective. In addition, the study was formed of a sample of 108 patients from a single UK Trust and hence may preclude generalisation. In more general terms, our study, like most in the literature, has used a variety of outcomes to assess patient comfort during FOB. These various outcomes, such as Likert scales for patient reported comfort, bronchoscopist reported tolerance, satisfaction with scope insertion and likelihood of returning for repeat FOB, may distract from the primary outcome. We suggest that the true benchmark of patient comfort during FOB should be patient reported comfort as assessed via a 5-point Likert scale in order to improve generalizability and simplicity.

In summary, our study adds to the evidence that a poorer WHO performance status is associated with poorer tolerance of FOB; as such, this should prompt proactive strategies to focus greater attention on such patients to ensure improved satisfaction with FOB. Also the need for an FOB needs to be carefully considered in this group. FOB aides in establishing tissue diagnosis; however, if due to a poor performance status the patient is not fit for any treatment then the procedure will not achieve anything. Our data hints that improved patient comfort is associated with a higher perception of care given around the procedure. As highlighted by the UK Department of Health and the BTS guidelines on bronchoscopy, audit of patient satisfaction with FOB holds numerous benefits, such as improved communication between patients and staff and improved public trust in the healthcare provider and the service (2;3). Such information should inform planning and service improvement to form patient centred, accessible, and responsive services, and allow patients to shape the services they use. ■

References

1. Lechtzin N, Rubin HR, White Jr P, Jenckes M, Diette GB. Patient satisfaction with bronchoscopy. *Am J Respir Crit Care Med* 2002;166(10):1326-31.
2. Department of Health. Understanding what matters: A guide to using patient feedback to transform care. 22-5-2009. Crown.
3. Du Rand IA, Blaikley J, Booton R, Chaudhuri N, Gupta V, Khalid S, et al. British Thoracic Society guideline for diagnostic flexible bronchoscopy in adults: accredited by NICE. *Thorax* 2013 Aug 1;68(Suppl 1):i1-i44.
4. Hirose T, Okuda K, Ishida H, Sugiyama T, Kusumoto S, Nakashima M, et al. Patient satisfaction with sedation for flexible bronchoscopy. *Respirology* 2008;13(5):722-7.
5. Hadzri HM, Azarisman SMS, Fauzi ARM, Roslan H, Roslina AM, Adina ATN, et al. Can a bronchoscopist reliably assess a patient's experience of bronchoscopy? *JRSM short reports* 2010;1(4):35.
6. Bernasconi M, Chhajed PN, Muller P, Borer H. Patients Satisfaction with Flexible Bronchoscopy in a Hospital-Based Community Practice. *Respiration* 2009;78(4):440-5.
7. Lechtzin N, Rubin HR, Jenckes M, White Jr P, Zhou LM, Thompson DA, et al. Predictors of pain control in patients undergoing flexible bronchoscopy. *Am J Respir Crit Care Med* 2000;162(2):440-5.
8. Putinati S, Ballerin L, Corbetta L, Trevisani L, Potena A. Patient satisfaction with conscious sedation for bronchoscopy. *CHEST* 1999;115(5):1437-40.
9. Palayew M, Dajczman E, Klebansky W, Kupfer P, Kreisman H, Small D. Perception of discomfort by patients, physicians, and respiratory technicians during flexible bronchoscopy. *Journal of Bronchology & Interventional Pulmonology* 2004;11(1):17-21.
10. Salajka F. Assessment of bronchoscopic examination made by patients and physician. 1997.
11. Dubois JM, Bartter T, Pratter MR. Music improves patient comfort level during outpatient bronchoscopy. *CHEST* 1995;108(1):129-30.
12. Poi PJ, Chuah SY, Srinivas P, Liam CK. Common fears of patients undergoing bronchoscopy. *Eur Respir J* 1998;11(5):1147-9.
13. Mitsumune T, Senoh E, Adachi M. Prediction of patient discomfort during fibreoptic bronchoscopy. *Respirology* 2005;10(1):92-6.