

Short Report

Detection of comorbid illnesses during pre-anaesthesia evaluation in a university teaching hospital: A prospective observational study

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ABSTRACT

Background. Consultation for surgery and anaesthesia is often the first point of contact with a healthcare provider for a majority of patients in developing countries. In India, where patients have poor access to healthcare, they are likely to present with uncontrolled/untreated/undetected coexisting diseases. However, there is little published literature on this aspect. We hypothesized that many of our patients will present to our pre-anaesthesia evaluation clinic (PAC) with undetected comorbid illnesses and will require proper assessment, treatment and optimization before surgery. Thus, we aimed to assess the frequency and type of comorbid illnesses in patients attending the pre-anaesthesia clinic for elective surgery.

Methods. We did a prospective observational study on all patients evaluated in the PAC of our university teaching hospital over a 3-month period to assess the frequency and type of comorbid illnesses. The data recorded included demographic profile and presence of coexisting illness and was classified as pre-existing or newly diagnosed at the time of the visit to the PAC. The data were then tabulated and analysed statistically using SPSS software version 14.0. The frequency and percentage of occurrence for each comorbid illness was determined.

Results. Of 3973 patients, 242 (6%) had 304 comorbid illnesses (135 cardiac, 54 endocrine, 15 respiratory, 12 others). Of these 88 (29%) were newly detected comorbid conditions (69 cardiac, 9 endocrine, 9 respiratory, 1 others). The most frequent comorbid illness both pre-existing and newly diagnosed were cardiac. Hypertension was the commonest problem in our study population (168 patients).

Conclusion: We confirmed that a PAC can detect hitherto undetected comorbid illnesses which are likely to impact the perioperative process.

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INTRODUCTION

Pre-anaesthesia evaluation is now an integral part of anaesthesia practice and its value is well established in reducing unnecessary investigations and consultation,^{1–3} decreasing duration of hospital stay,^{4,5} increasing operating room efficiency by decreasing case cancellations and delays,^{4,6,7} risk reduction through preoperative intervention,⁸ and reducing perioperative morbidity and mortality.⁴

A consultation for surgery and anaesthesia is often the first point of contact with a healthcare provider for many patients in developing countries. The profile of our patients tends to be different from those of developed countries, where coexisting diseases are well managed due to better penetration of health services. In India, where patients have poor access to healthcare, we expect patients to present with coexisting diseases which have not been detected or if detected are inadequately treated. We therefore evaluated all patients attending our pre-anaesthesia evaluation clinic (PAC).

METHODS

We conducted a prospective observational study including all patients evaluated in the PAC of our university teaching hospital over a 3-month period. The clinic is a part of the outpatient services, where all patients posted for elective surgical cases are evaluated. Informed consent was obtained from all patients. Any patient returning to the PAC after the first visit was excluded to avoid duplication of data.

A total of 3973 patients were seen during the study period. A detailed history was taken and general physical and systemic examination was done by residents under the supervision of consultant anaesthetists. The presence of any pre-existing comorbid illness was recorded and the patient was thoroughly screened for other comorbid illnesses. The haemoglobin level was estimated for all patients. For patients >18 years of age, a chest X-ray and electrocardiogram were obtained. A random blood sugar check was also done, which if abnormal was followed up with a fasting and postprandial blood sugar test. Other investigations as indicated according to the comorbid condition or surgical condition were done. Hypertension was diagnosed according to the Joint National Committee 7 criteria⁹ and diabetes according to the American Diabetes Association 2011 criteria.¹⁰ Other diseases such as ischaemic heart disease, asthma, chronic obstructive pulmonary disease (COPD), etc. were diagnosed on the basis of clinical criteria. Thyroid disorders were diagnosed according to clinical and laboratory criteria. As we expected anaemia to be widely prevalent and clinically apparent, for the purpose of this study we defined severe anaemia as per the WHO guideline, i.e. haemoglobin level <7 g/dl as significant.¹¹ The comorbid illness was optimized after appropriate consultation by other specialists if required. The patient was accepted for anaesthesia and surgery as determined by the consultant anaesthetist after the assessment, additional investigations and optimization whenever indicated.

The data recorded included demographic profile and presence of coexisting illness. The coexisting illnesses were classified as pre-existing or newly diagnosed at the time of the visit to the PAC. The data were then tabulated and analysed statistically using SPSS software version 14.0. The frequency and percentage of occurrence for each comorbid illness were determined.

RESULTS

During the 3-month study period, a total of 3973 patients (1933 men and 2040 women) were seen at the PAC. Of these, 242 patients (6%) had 304 comorbid illnesses. Among these, 88 (29%) comorbid conditions were newly diagnosed and 216 (71.1%) were pre-existing at the time of the patients' first PAC visit. The mean age of the patients with comorbid conditions was 49.4 years (range 8–83 years) and 103 were men (42.6%).

The most frequent comorbid illnesses both pre-existing and newly diagnosed were cardiac, and hypertension was the commonest problem (Table I). Of the 60 newly diagnosed patients with hypertension, 46 (76.7%) were <50 years of age.

A total of 187 patients had one, 45 had two and 10 had three comorbid conditions, thus almost one-quarter (22.7%) of patients had more than one comorbid condition. Of these, 34.5% were 20–60 years whereas 65.5% were >60 years of age (Table II).

Of the 63 patients with endocrine disorders, diabetes mellitus was seen in 46 and hypothyroidism in 15. Of the 24 patients with respiratory disorders, 21 patients had chronic obstructive pulmonary disease, 2 had asthma and 1 had interstitial lung disease. Of the 13 other patients, 2 had severe anaemia.

DISCUSSION

Pre-anaesthesia evaluation has been defined as the process of clinical assessment that precedes the delivery of anaesthesia care for surgery and for non-surgical procedures.¹² It involves the assessment of information from multiple sources including medical records, patient interviews, physical examination findings and preoperative tests and consultations when appropriate.¹²

It provides a valuable interface between patients and healthcare providers and has now become a means of coordinating perioperative care. Previously, patients planned for elective surgical procedures were admitted a day before surgery and it was then that the pre-anaesthesia evaluation and optimization was carried out. This led to delays, case cancellations and administrative problems. This practice has now been phased out in many parts of the world in favour of the more cost-effective evaluation and optimization at the outpatient pre-anaesthetic clinic, the concept of which had been originally proposed by Lee in 1949¹³ and such clinics have been in place since the 1990s in the USA,^{3,7,14} Canada,¹⁵ Australia¹⁶ and Europe.⁵

Despite a thorough search of the literature we could identify only one study which gave data regarding patients presenting with new and old medical problems. In this study done at the Brigham and Women's Hospital, Boston, Massachusetts, 5083 patients were seen in the preoperative clinic over a 3-month period; 647 (12.7%) patients had 680 medical issues requiring further information or management. Of these, 565 (83%) were thought to require further information regarding known medical problems, and 115 (17%) were new medical problems first identified in the clinic. Most of the new problems required that a new test be done or a new consultation be sought, whereas most of the old problems required retrieval of existing information from other medical centres.¹⁷ Thus, they showed that a preoperative clinic can identify the common types of medical problems (cardiac and haematological) that account for perioperative problems, delays and cancellations.

In our study, 6% of patients had comorbid illnesses at the time of presentation to the PAC, of which 29% were newly diagnosed. Compared to the above study, a significantly higher percentage of comorbid conditions detected in our study were newly diagnosed requiring fresh work-up. Although we did not quantify the level of optimization of a patient with pre-existing disease presenting to the PAC, we expect our patients to be less well cared for than their western counterparts because of poor access to healthcare. Also the level of patient education and awareness, record-keeping and retrieval of existing records is poor in India. Further, most of the comorbid illnesses encountered were hypertension, diabetes, COPD, etc., which we expect to be optimized over a period of 2 weeks. We, therefore, propose that patients be seen at least 2 weeks before surgery for all elective cases in order to have time for necessary work-up and optimization.

Pre-anaesthesia evaluation has been shown to decrease perioperative morbidity and mortality,⁴ decrease excessive preoperative testing,^{2–4} decrease case cancellations and delays by appropriate identification, proper risk assessment and optimization of medical issues,^{4,6,7} decrease hospital stay,^{4,5} decrease surgical complications,¹⁸ decrease subspecialty consultations,³ result in financial benefit,¹⁴ assist in preoperative optimization and help the anaesthesiologist in establishing a rapport with the patient. A point to note is that a different anaesthesiologist may conduct the anaesthesia and not the one who has evaluated the patient preoperatively. This lacuna may be overcome by review of every patient on the next day's operating list by the concerned anaesthetist as is routine at our institution.

The PAC visit provided an opportunity to intervene before the surgery, make changes in the perioperative medical management and possibly reduce risk, for example by starting β -blockers or perioperative anticoagulation when indicated. Davenport *et al.* highlighted that, because preoperative risk factors are effective predictors of hospital costs, preoperative intervention to reduce risk could lead to significant cost savings.⁸ Other comorbid conditions that could benefit from timely intervention before the occurrence of an adverse event include sleep apnoea and chronic obstructive airway disease. Patients with increased risk of postoperative nausea and vomiting, aspiration, malignant hyperpyrexia, etc. may be identified and steps taken to reduce the risk of such events. Also, as observed by Correll *et al.*, the results of the PAC visit are likely to impact the perioperative management of the patient because the patient's medical condition will influence the decision made during the perioperative period.¹⁷

There is also an important untapped potential of the PAC to diagnose and treat chronic diseases. Several previous studies have

TABLE I. Comorbid conditions present or detected during pre-anaesthesia evaluations

Type of comorbid condition	Comorbid condition		
	Old (%) (n=216)	New (%) (n=88)	Total (%) (n=304)
Hypertension	108 (35.5)	60 (19.7)	168 (55.3)
Ischaemic heart disease	27 (8.9)	9 (3.0)	36 (11.8)
Endocrine	54 (17.8)	9 (3.0)	63 (20.7)
Respiratory	15 (4.9)	9 (3.0)	24 (7.9)
Others	12 (4.0)	1 (0.3)	13 (4.3)

TABLE II. Age-wise distribution of comorbid illnesses

Age (years)	Comorbid condition		
	One (%)	>1 (%)	Total
<20	5 (100)	0 (0)	5
20–60	134 (87.6)	19 (12.4)	153
>60	48 (57.1)	36 (42.9)	84

shown that pre-existing conditions may be detected during pre-anaesthesia examination.^{17,18} In India, the PAC can assist the primary healthcare system in screening patients for chronic diseases such as ischaemic heart disease, hypertension and diabetes mellitus, and provide a referral system for many patients who come in contact with a healthcare provider for the first time. For instance, we found that of 242 patients with comorbid illnesses, 168 (69.4%) had hypertension of which 60 (24.8%) were diagnosed for the first time at the PAC. In fact, of these 60 new patients, over 75% patients were <50 years of age and who would otherwise not have been screened for hypertension. Similarly, 9 (3.7%) of 242 patients were first diagnosed with endocrine disorders such as diabetes mellitus and hypothyroidism and another 3.7% patients were first diagnosed to have ischaemic heart disease at the PAC. However, there were only two patients with severe anaemia. This was in contrast to our expectation and was probably because severe anaemia is apparent on clinical examination and is treated by the surgeon before referral to the PAC. All of the above diseases would have had an impact on the perioperative management.

Our findings are limited by our not assessing the impact of detection of the comorbid illness on intraoperative management. Also, since the patients were not tracked postoperatively, the impact of the detection of comorbid illness on morbidity and mortality could not be evaluated. The delay due to inadequate optimization of pre-existing disease or work-up of newly diagnosed illness was also not quantified. Though the data collected were from a single centre, we can draw certain conclusions as we expect the patient population to be similar in similar type of institutions.

Based on our experience, we suggest that:

1. The PAC visit should be scheduled approximately 2 weeks before admission of a patient, even in apparently healthy patients so as to allow time to conduct additional investigations, consultation and optimization should any comorbid illness be detected.
2. The pre-anaesthetic examination should be focused on the cardiac, respiratory and endocrine systems as these are the most common comorbid illnesses encountered.
3. PAC of elderly patients must be done with due care as they are more likely to have more than one comorbid condition.

In summary, our study confirmed our hypothesis by showing that a PAC can detect hitherto undetected comorbid illnesses which are likely to impact the preoperative process.

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