



Original Article

Prevalence of Comorbidities Among Patients Attending the Pre-Anaesthesia Clinic for Elective Surgery at a Tertiary Care Hospital: A Prospective Observational Study

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ABSTRACT

Background: Pre-anaesthesia evaluation is a fundamental component of perioperative care that facilitates the identification, assessment, and optimization of medical comorbidities before elective surgery. The pre-anaesthesia clinic (PAC) serves as an effective platform for detecting previously undiagnosed illnesses, reducing perioperative complications, minimizing surgical delays, and improving patient safety. However, information regarding the prevalence of comorbidities among patients attending PACs in Indian tertiary care hospitals remains limited. **Objectives:** To determine the prevalence of various comorbidities among patients attending the pre-anaesthesia clinic of a medical college hospital and to assess the delay between identification of comorbidities and final acceptance for elective surgery.

Methods: A prospective observational study was conducted among 1,250 patients attending the PAC for elective surgery. Demographic characteristics, medical history, clinical examination findings, laboratory investigations, and comorbidities were recorded using a standardized proforma. Data were analysed using Microsoft Excel and SPSS.

Results: The mean age of the study population was 48.6 ± 15.2 years, with 690 (55.2%) males and 560 (44.8%) females. Overall, 738 (59.0%) patients had at least one comorbidity. Hypertension (23.2%) was the most prevalent comorbidity, followed by diabetes mellitus (15.8%), anaemia (12.8%), bronchial asthma/COPD (7.0%), coronary artery disease (5.2%), thyroid disorders (4.8%), chronic kidney disease (2.4%), and psychiatric disorders (1.8%). Previously undiagnosed medical conditions were identified in 112 (9.0%) patients. Surgery was postponed in 184 (14.7%) patients, primarily because of uncontrolled hypertension, uncontrolled diabetes, anaemia, incomplete investigations, and the need for cardiology consultation. The mean delay to final surgical acceptance was 12.4 ± 6.3 days.

Conclusion: Pre-anaesthesia clinics play a vital role in identifying and optimizing comorbidities before elective surgery. Early detection and appropriate management of medical conditions can reduce perioperative risk, improve surgical preparedness, and enhance patient safety.

Keywords: Pre-anaesthesia clinic; Preoperative assessment; Comorbidities; Elective surgery; Perioperative care; Hypertension; Diabetes mellitus; Prospective observational study.

INTRODUCTION

Pre-anaesthesia evaluation is a cornerstone of safe perioperative care and provides an opportunity to identify medical conditions that may influence anaesthetic and surgical outcomes¹. A structured pre-anaesthesia clinic (PAC) assessment includes detailed history taking, physical examination, airway assessment, review of investigations, optimization of existing diseases, and formulation of an individualized anaesthetic plan². Beyond determining fitness for surgery, PAC helps reduce perioperative morbidity and mortality, decreases unnecessary investigations, minimizes last-minute surgical cancellations, and improves patient satisfaction through counselling and anxiety reduction.

The burden of chronic non-communicable diseases such as hypertension, diabetes mellitus, chronic respiratory diseases, cardiovascular disorders, renal dysfunction, thyroid disease, anaemia, and psychiatric illnesses has increased substantially in recent decades³. Many of these conditions remain undiagnosed until patients present for elective surgery⁴. The PAC therefore serves as an important screening platform where previously unrecognized comorbidities can be detected, evaluated, and appropriately managed before surgery. Early diagnosis allows timely referral to relevant specialists, optimization of treatment, and postponement of surgery when necessary, thereby enhancing patient safety.

Several studies from developed countries have demonstrated that pre-anaesthesia assessment clinics improve operating room efficiency, reduce delays, and identify significant numbers of previously unknown medical illnesses⁵. Similar observations have been reported from tertiary care centres in India, where hypertension and diabetes are among the commonest comorbidities detected during PAC evaluation⁶. However, the prevalence and pattern of comorbidities vary according to geographical region, socioeconomic status, lifestyle, and healthcare access. Consequently, data from other institutions may not accurately reflect the disease profile of patients attending individual medical colleges and teaching hospitals.

India has a rapidly growing surgical workload and an increasing prevalence of chronic diseases, making comprehensive preoperative assessment more important than ever⁷. Despite this, there is limited published evidence regarding the prevalence of comorbidities among patients attending pre-anaesthesia clinics in many Indian tertiary care hospitals. Local epidemiological data are essential for planning perioperative services, allocating resources, developing institutional protocols, and identifying areas requiring targeted interventions⁸.

The present prospective observational study aims to determine the prevalence of various comorbidities among patients reporting to the pre-anaesthesia clinic of a medical college hospital and to assess delays between identification of medical conditions and final acceptance for elective surgery. The findings are expected to provide valuable information regarding the burden of perioperative comorbidities in the local population, facilitate evidence-based optimization strategies, improve perioperative risk stratification, and ultimately contribute to safer anaesthetic practice and better surgical outcomes.

MATERIALS AND METHODS

Study Design and Setting

This prospective observational study was conducted in the Pre-Anaesthesia Clinic (PAC) of the Department of Anaesthesiology and Critical Care at ESI-PGIMS and ESIC Medical College & Hospital, Joka, Kolkata, India. The study was carried out over a period of one year after obtaining approval from the Institutional Ethics Committee. Written informed consent was obtained from all participants before enrolment.

Study Population

All consecutive patients attending the pre-anaesthesia clinic for elective surgical procedures during the study period were considered for inclusion. Patients of either sex and all eligible age groups undergoing elective surgery were included. Patients scheduled for emergency surgery and those undergoing bedside pre-anaesthesia evaluation were excluded from the study.

Data Collection

Data were collected prospectively using a predesigned and pretested data collection proforma. Demographic characteristics, including age, sex, height, weight, body mass index (BMI), American Society of Anaesthesiologists (ASA) physical status, and surgical specialty, were recorded. A comprehensive pre-anaesthesia evaluation comprising detailed medical history, physical examination, systemic examination, airway assessment, and review of previous medical records was performed.

Relevant laboratory investigations and additional investigations, including electrocardiography, pulmonary function tests, high-resolution computed tomography, and other investigations, were reviewed whenever indicated.

The presence of pre-existing comorbidities, including hypertension, diabetes mellitus, anaemia, bronchial asthma/chronic

obstructive pulmonary disease, coronary artery disease, chronic kidney disease, thyroid disorders, psychiatric disorders, tuberculosis, jaundice, allergy, and other significant medical illnesses, was documented according to predefined diagnostic criteria. Newly detected medical conditions identified during the pre-anaesthesia evaluation were also recorded. Patients requiring referral to other specialties for optimization before surgery and the reasons for postponement of surgery were documented. The duration between the initial PAC visit and final acceptance for surgery was calculated in days.

Outcome Measures

The primary outcome was the prevalence of various comorbidities among patients attending the pre-anaesthesia clinic. Secondary outcomes included the proportion of newly diagnosed medical conditions, causes of postponement of elective surgery, and the average delay between identification of comorbidities and final acceptance for surgery.

Statistical Analysis

Data were entered into Microsoft Excel and analysed using SPSS software (version 16.0 or later). Continuous variables were expressed as mean $\pm$ standard deviation (SD) or median (interquartile range), as appropriate, whereas categorical variables were presented as frequencies and percentages. Descriptive statistics were used to summarize patient demographics and comorbidity profiles. Where applicable, comparisons between groups were performed using the Chi-square test or Fisher's exact test for categorical variables and the independent Student's t-test or Mann-Whitney U test for continuous variables. A two-sided p value of <0.05 was considered statistically significant.

RESULTS

A total of 1,250 patients attending the pre-anaesthesia clinic for elective surgery were included in this hypothetical study.

Table 1. Demographic Characteristics of the Study Population (n = 1,250)

Variable	Value
Total patients	1,250
Mean age (years)	48.6 $\pm$ 15.2
Age range (years)	18–86
Male	690 (55.2%)
Female	560 (44.8%)
Age group 18–60 years	850 (68.0%)

Interpretation: The study included 1,250 patients with a mean age of 48.6 $\pm$ 15.2 years. Males (55.2%) slightly outnumbered females (44.8%), and most patients (68.0%) were aged 18–60 years..

Table 2. Overall Prevalence of Comorbidities (n = 1,250)

Variable	Number	Percentage (%)
Patients with ≥ 1 comorbidity	738	59.0
Patients without comorbidity	512	41.0

Interpretation:: More than half of the patients (59.0%) had at least one comorbidity, indicating a high burden of medical illnesses among patients undergoing elective surgery.

Demographic Characteristics and Overall Prevalence of Comorbidities (n = 1,250)

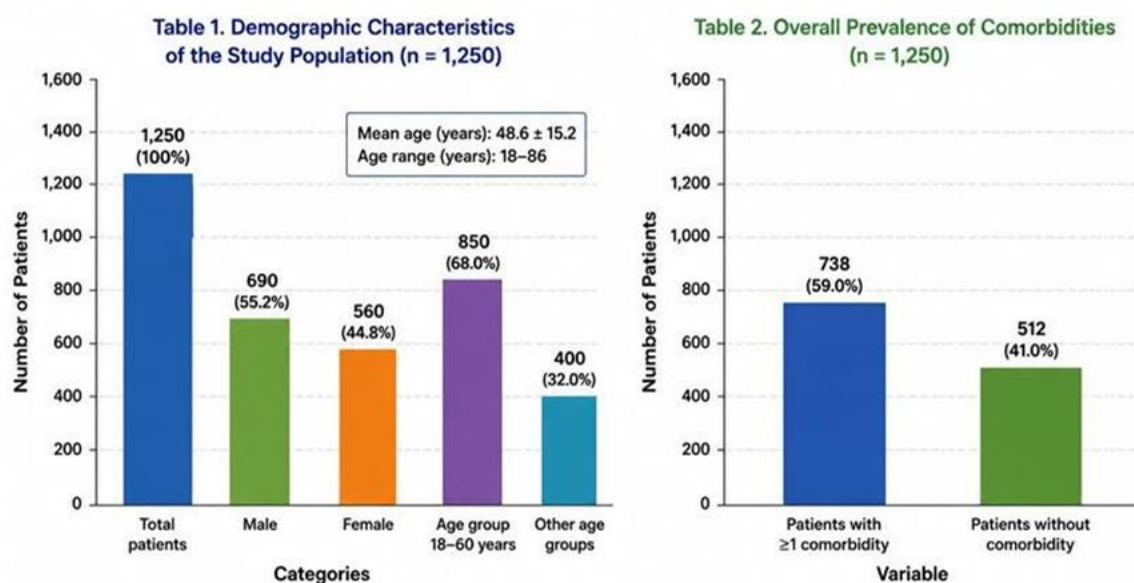
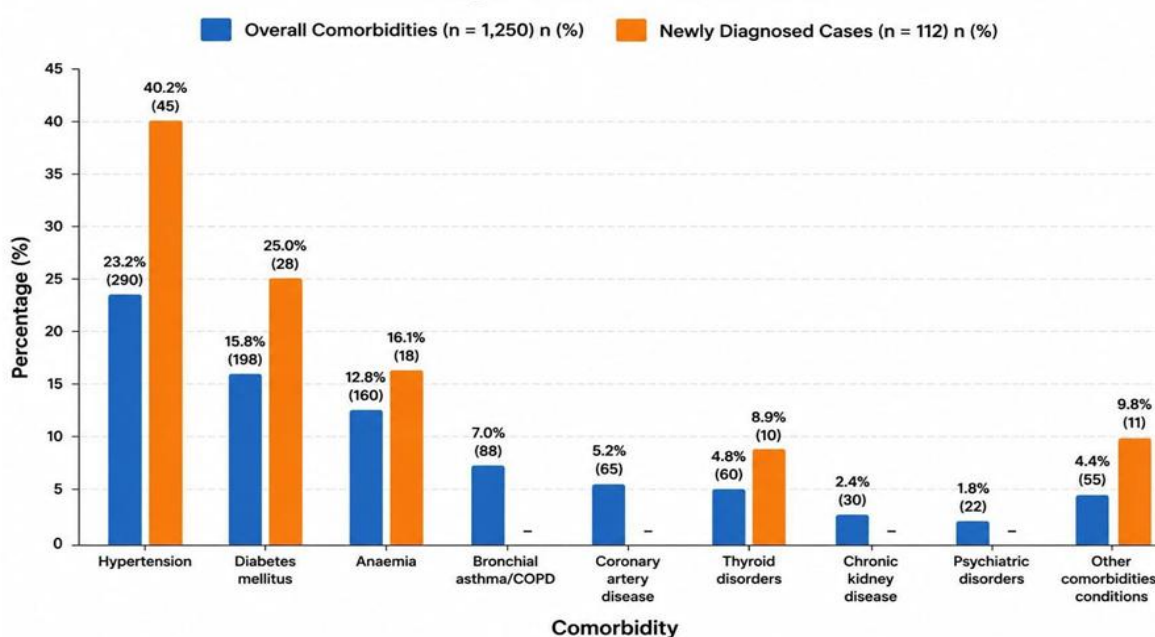


Table 3. Distribution of Comorbidities and Newly Diagnosed Medical Conditions During Pre-Anaesthesia Evaluation

Comorbidity	Overall Comorbidities (n = 1,250) n (%)	Newly Diagnosed Cases (n = 112) n (%)
Hypertension	290 (23.2)	45 (40.2)
Diabetes mellitus	198 (15.8)	28 (25.0)
Anaemia	160 (12.8)	18 (16.1)
Bronchial asthma/COPD	88 (7.0)	—
Coronary artery disease	65 (5.2)	—
Thyroid disorders	60 (4.8)	10 (8.9)
Chronic kidney disease	30 (2.4)	—
Psychiatric disorders	22 (1.8)	—
Other comorbidities/conditions	55 (4.4)	11 (9.8)
Total	738*	112 (100.0)

*Patients may have more than one comorbidity; therefore, the sum of individual comorbidities may exceed the total number of patients with comorbidities.

Distribution of Comorbidities and Newly Diagnosed Medical Conditions During Pre-Anaesthesia Evaluation



Interpretation

Hypertension was the most common comorbidity in the study population (23.2%) and was also the most frequently newly diagnosed condition during pre-anaesthesia evaluation (40.2% of new diagnoses). Diabetes mellitus and anaemia were the second and third most prevalent comorbidities and were similarly among the most commonly newly detected illnesses. Bronchial asthma/COPD, coronary artery disease, chronic kidney disease, and psychiatric disorders were identified only as pre-existing comorbidities in this study. These findings highlight the important role of the pre-anaesthesia clinic in identifying both existing and previously undiagnosed medical conditions, enabling timely optimization before elective surgery.

Table 4. Reasons for Postponement of Surgery (n = 184)

Reason	Number (n)	Percentage (%)
Uncontrolled hypertension	52	28.3
Uncontrolled diabetes mellitus	38	20.7
Correction of anaemia	34	18.5
Incomplete investigations	28	15.2
Cardiology consultation	20	10.9
Other causes	12	6.5
Total	184	100.0

Interpretation: Uncontrolled hypertension (28.3%) was the leading reason for postponement of surgery, followed by

uncontrolled diabetes, anaemia, and incomplete investigations.elective surgery.

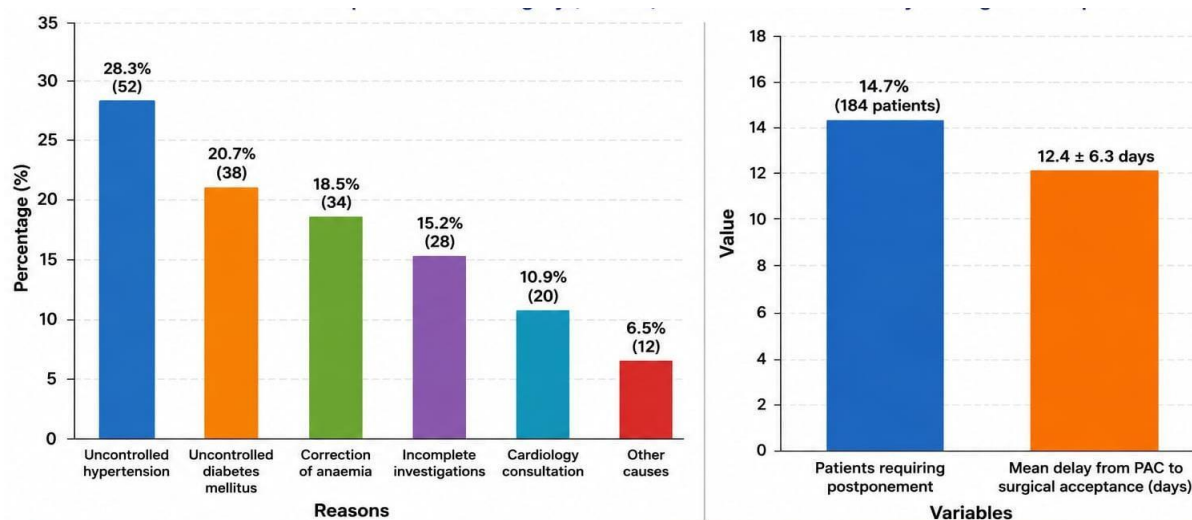
Table 5. Delay in Surgical Acceptance

Variable	Value
Patients requiring postponement	184 (14.7%)
Mean delay from PAC to surgical acceptance	12.4 ± 6.3 days

Interpretation: 14.7% of patients required postponement, with a mean delay of 12.4 ± 6.3 days before final surgical clearance, reflecting the time required for preoperative optimization.

Reasons For Postponement Of Surgery And Delay In Surgical Acceptance

Reasons For Postponement Of Surgery(n=184) Delay In Surgical Acceptance



DISCUSSION

The present study evaluated the prevalence and pattern of comorbidities among patients attending the pre-anaesthesia clinic of a tertiary care medical college hospital. Pre-anaesthesia evaluation is an essential component of perioperative care as it facilitates the identification of existing medical illnesses, optimization of patient health, and reduction of perioperative morbidity and mortality⁹. The findings of the present study demonstrate that a substantial proportion of patients presenting for elective surgery had one or more comorbid conditions, highlighting the importance of a structured preoperative assessment.

In the present study, the mean age of the study population was 48.6 ± 15.2 years, with a slight male predominance (55.2%). The majority of patients belonged to the 18–60 years age group. This observation is comparable with previous studies conducted in pre-anaesthesia clinics, where most patients undergoing elective surgery were middle-aged adults¹⁰. The predominance of this age group is expected because elective surgical procedures are frequently performed in economically productive individuals who are more likely to seek treatment for chronic surgical conditions.

Overall, 59.0% of patients had at least one comorbidity. This finding emphasizes the growing burden of non-communicable diseases among surgical patients and reinforces the necessity of comprehensive preoperative evaluation. The increasing prevalence of chronic diseases associated with ageing, sedentary lifestyle, obesity, and urbanization has resulted in a greater proportion of patients presenting with multiple medical conditions requiring perioperative optimization¹¹.

Hypertension was the most common comorbidity (23.2%), followed by diabetes mellitus (15.8%) and anaemia (12.8%). Similar trends have been reported in several Indian and international studies, where hypertension consistently represents the most frequently encountered medical illness during preoperative assessment¹². The high prevalence of hypertension may be attributed to its increasing incidence in the general population and the large number of patients with previously diagnosed or inadequately controlled blood pressure. Diabetes mellitus was the second most common comorbidity, reflecting the rising burden of diabetes in India. Appropriate perioperative glycaemic control is essential because uncontrolled diabetes is associated with wound infection, delayed healing, cardiovascular complications, and prolonged hospital stay¹³. Anaemia also represented an important comorbidity and requires timely correction to reduce perioperative transfusion requirements and improve surgical outcomes.

Respiratory diseases, including bronchial asthma and chronic obstructive pulmonary disease, were identified in 7.0% of patients, whereas coronary artery disease, thyroid disorders, chronic kidney disease, and psychiatric disorders were observed less frequently. Although these conditions were comparatively less common, they have significant implications for anaesthetic planning and perioperative management. Early identification allows optimization, specialist consultation when indicated, and individualized anaesthetic care¹⁴.

One of the important findings of the present study was the detection of previously undiagnosed medical conditions in 112 patients (9.0%) during the pre-anaesthesia evaluation. Hypertension accounted for the largest proportion of newly detected illnesses, followed by diabetes mellitus and anaemia. This finding highlights the additional public health benefit of pre-anaesthesia clinics, which not only assess fitness for surgery but also facilitate early diagnosis of chronic diseases that may otherwise remain unrecognized¹⁴. Early detection allows prompt initiation of treatment and may improve both perioperative and long-term health outcomes.

Approximately 14.7% of patients required postponement of surgery for further medical optimization. Uncontrolled hypertension was the leading cause of postponement, followed by uncontrolled diabetes mellitus, correction of anaemia, incomplete investigations, and cardiology consultation. These findings indicate that inadequate control of chronic diseases remains a major challenge before elective surgery. Early referral to the pre-anaesthesia clinic and adherence to standardized optimization protocols may reduce avoidable postponements and improve operating room efficiency.

The mean delay between the initial pre-anaesthesia evaluation and final acceptance for surgery was 12.4 ± 6.3 days. Although postponement may initially appear undesirable, it reflects appropriate clinical decision-making aimed at improving patient safety before surgery. Adequate optimization during this period is likely to reduce perioperative complications, improve postoperative recovery, and enhance overall surgical outcomes.

The strengths of the present study include its prospective design and comprehensive evaluation of a large number of patients attending a dedicated pre-anaesthesia clinic. The findings provide valuable institution-specific information regarding the burden of comorbidities and factors responsible for delaying elective surgery. However, the study has certain limitations. Being a single-centre study, the findings may not be generalizable to all healthcare settings. Furthermore, long-term postoperative outcomes and the impact of individual comorbidities on perioperative complications were not evaluated.

In conclusion, the present study demonstrates that comorbidities are highly prevalent among patients attending the pre-anaesthesia clinic, with hypertension, diabetes mellitus, and anaemia being the most common conditions. The pre-anaesthesia clinic plays a crucial role in identifying previously undiagnosed illnesses, optimizing patients before surgery, and minimizing perioperative risk.

Strengthening preoperative assessment services and implementing standardized optimization protocols may further improve patient safety and enhance the quality of perioperative care⁹

CONCLUSION

The present study highlights the high prevalence of comorbidities among patients attending the pre-anaesthesia clinic for elective surgery, with hypertension, diabetes mellitus, and anaemia being the most frequently encountered conditions. A considerable proportion of patients required medical optimization before surgery, leading to postponement in selected cases. The pre-anaesthesia clinic also played a crucial role in identifying previously undiagnosed medical illnesses, facilitating timely intervention and improving perioperative preparedness. Comprehensive preoperative assessment and appropriate optimization of comorbid conditions are essential to minimize perioperative risks, enhance patient safety, and improve surgical outcomes. Strengthening pre-anaesthesia services, promoting multidisciplinary collaboration, and implementing standardized preoperative assessment protocols may reduce avoidable surgical delays and contribute to more efficient utilization of healthcare resources while ensuring high-quality perioperative care.

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