

ORIGINAL ARTICLE

Evaluation of Patterns of Comorbidities Among Patients Admitted for Elective and Emergency Surgery for Avoiding Medico-Legal Conflict

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Abstract:

Comorbidity, defined as several diseases in a patient connected through proven pathogenic mechanisms, necessitates identifying the diseases requiring primary and subsequent treatment. The comorbid condition may invite unnecessary conflict while treating surgically, which needs special pre and post-operative attention. The present study aims to evaluate the prevalence and the patterns of comorbidities among patients admitted for elective and emergency surgery to avoid medico-legal conflict. The present hospital-based prospective observational study was undertaken at the Department of Surgery, Gauhati Medical College and Hospital (GMCH), Guwahati, from June 1, 2018, to May 31, 2019. All patients admitted for elective or emergency surgery, with neither or at most two comorbid conditions fulfilling the inclusion-exclusion criteria, were included in the study. The data were analysed using SPSS V 21. A total of 309 cases were selected for the study. Most of the cases belonged to the age group 20-49 years, males (73%) and belonged to lower socioeconomic status (63.7%). Among females, chronic calculous cholecystitis (62.7%), while among males, hollow viscus perforation (35.4%) and unilateral and obstructed inguinal hernia (23.0%) were mainly reported. Almost 53% of the cases had comorbidity. Anaemia (18.1%), hypertension (16.9%) and type 2 diabetes mellitus (12.0%) mainly were reported comorbidities among females, while among males, type 2 diabetes mellitus (15.0%) and chronic obstructive pulmonary diseases (11.5%) were the most common. Comorbidities were prevalent among the study group. The adult age group is more prone to having one or more comorbidities. Controlling comorbidities in the preoperative phase is crucial in surgery for a better outcome.

Keywords: Comorbidity; Anaemia; Hypertension; Hollow viscus perforation; Type 2 diabetes mellitus.

Introduction:

Current medicine, which boasts a vast range of diagnostic methods and a variety of treatments, emphasises specification. To decide the starting point of treatment and identify the diseases requiring primary and subsequent treatment, it is necessary to evaluate the state of a patient who suffers from several diseases simultaneously. Some authors define comorbidity and multi-morbidity differently, defining the former as several diseases in a patient connected through proven pathogenetic mechanisms.¹

Medicolegal implications are related not only to postoperative complications as events but also to general malpractice in terms of incorrect surgical indications or lack of basic requirements for surgical practice such as informed consent and failure to identify the comorbid condition. Various causes of comorbidities include anatomic proximity of diseased organs, precise pathogenetic mechanism of several diseases and terminable cause-effect

relation between the diseases and one disease resulting from complications of another. Chronic infections, inflammations, involitional and systematic metabolic changes, iatrogenesis, social status, ecology and genetic susceptibility, etc., are the various factors for the development of comorbidity. A practitioner must follow principles while developing a clinical diagnosis for a comorbid patient. The essential premise is distinguishing between primary and secondary diseases and their consequences and concomitant disorders.^{2,3} There are currently several generally accepted methods of evaluating comorbidity.³ Despite the range of approaches for evaluating comorbidity, there must be a single commonly accepted method free of the shortcomings of the current methods' causes' disruption. At the same time, the practitioner is still determining its prognostic influence due to variation in the approach to a comorbid state analysis, rendering the commonly available systems of linked pathology evaluation unreasoned and hence unnecessary. Our healthcare system must increasingly address managing people with comorbidities, who are now the norm rather than the exception. This understanding is responsible for surgeons' rising interest in the influence of comorbidity on various outcomes, including mortality, health-related quality of life, functioning, healthcare quality and postoperative outcome. Many a time the comorbid conditions of patients are overlooked resulting in

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Table 1. Demographic characteristics of the patients.

Characteristics	Subgroup	No. of cases (%)
Age	10-19	15 (4.85)
	20-29	71 (22.97)
	30-39	75 (24.27)
	40-49	60 (19.41)
	50-59	58 (18.77)
	60-69	27 (8.74)
	70-80	3 (0.97)
Sex	Male	226 (73.14)
	Female	83 (26.86)
Religion	Hindu	66 (21.36)
	Muslim	214 (69.25)
	Christian	18 (5.82)
	Buddhism	11 (3.56)
SES	Lower class	197 (63.75)
	Lower middle	102 (33.01)
	Upper middle	10 (3.24)

Table 2. Types of underlying diseases among cases.

Disease	Male	Female	Total
Acute appendicitis	7 (3.1)	5 (6.0)	12 (3.9)
Acute intestinal obstruction	25 (11.1)	20 (24.1)	45 (14.6)
Chronic calculous cholecystitis	28 (12.4)	52 (62.7)	80 (25.9)
Hollow viscus perforation	80 (35.4)	0	80 (25.9)
Obstructed inguinal hernia	22 (9.7)	0	22 (7.1)
Recurrent appendicitis	12 (5.3)	6 (7.2)	18 (5.8)
Unilateral inguinal hernia	52 (23.0)	0	52 (16.8)

Table 3. Types of underlying diseases among cases.

Comorbidity	Male	Female	Total
None	116 (51.3)	29 (34.9)	145 (46.9)
Anaemia	22 (9.7)	15 (18.1)	37 (12.0)
Chronic obstructive pulmonary disease	26 (11.5)	6 (7.2)	32 (10.4)
Coronary artery disease	2 (0.9)	5 (6.0)	7 (2.3)
Coronary artery disease: post CABG	2 (0.9%)	0 (0.0%)	2 (0.6)
Hypertension	22 (9.7)	14 (16.9)	36 (11.7)
Hypertension and type 2 diabetes mellitus	2 (0.9)	4 (4.8)	6 (1.9)
Type 2 diabetes mellitus	34 (15.0)	10 (12.0)	44 (14.2)

inconveniences including the invitation of legal conflict. Therefore, the present study was undertaken at the Department of Surgery, GMCH, Guwahati to evaluate the prevalence and the patterns of comorbidities among patients admitted to the study hospital for elective and emergency surgery during the study period to prepare the cases for a better outcome, so that medicolegal conflict can be avoided.

Materials and methods:

The present hospital-based prospective observational study was undertaken at the Department of Surgery, Gauhati Medical College and Hospital (GMCH), Guwahati from June 1, 2018 to May 31, 2019. The study comprised all patients admitted to the Department of Surgery, GMCH, Guwahati for elective or emergency surgery during the study period. Institutional ethical committee clearance was obtained before the commencement of the study. Informed consent was taken from all patients or their attendees.

All patients admitted for elective or emergency surgery with none or, at most, two comorbid conditions were included in the study. Patients with more than two comorbid conditions, traumatic

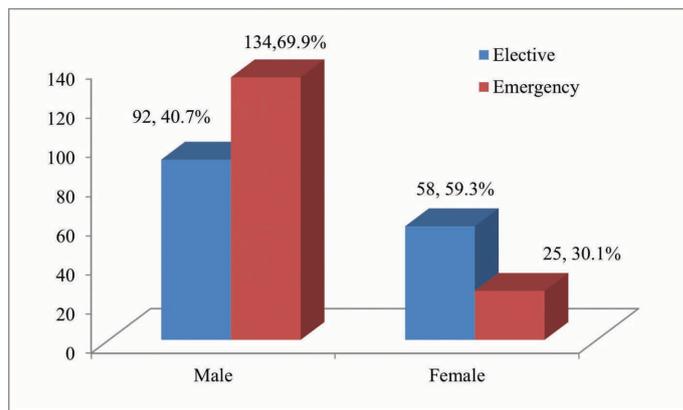


Figure 1. Type of surgery.

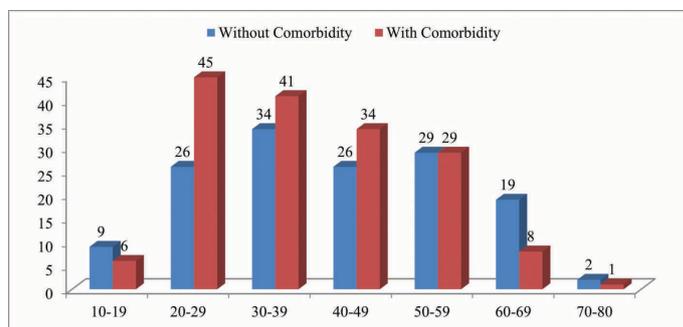


Figure 2. Age-wise distribution of cases with comorbidity.

cases (blunt trauma and penetrating trauma) and conservatively managed cases were excluded. Patients above 80 years of age were also not included in the study.

A detailed history, including the comorbid conditions and any treatment undergone, was recorded. Preoperative investigations of the patients and additional investigations for comorbid conditions were also undertaken. Appropriate radiological and biochemical investigations were done according to the patient's comorbid condition. The data were recorded on a predesigned questionnaire.

Surgical interventions were undertaken after an adequate preoperative assessment and only after getting informed consent. The ethics committee of GMCH, Guwahati, Assam has approved this research work vide reference, MC/190/2007/Pt-1/IEC/105 dated 05/04/2018.

Statistical analysis: All the data were analysed using the IBM SPSS version 21 software. Data distributions were presented as counts, percentages (numerical summaries) and graphs.

Results:

Three hundred nine cases were selected for the study with a minimum age of 11 and a maximum of 78. The mean (\pm standard deviation) age was 39.9 (\pm 14.0) years. Most cases belonged to the age group 20-49 years and 73% were males. Most cases (69%) were Muslims and belonged to lower socioeconomic status (63.7%), as shown in Table 1. Of the 309 cases, 51.5% were admitted for emergency surgery. Most female (69.9%) cases required elective surgery (Fig 1).

The majority, 26% of the total cases, suffered from chronic

calculous cholecystitis and was primarily reported among females (62.7%). Hollow viscus perforation (35.4%) and unilateral and obstructed inguinal hernia (23.0%) were the most underlying diseases among males. Almost 15% of the cases suffered from acute intestinal obstruction (Table 2).

Almost 53% of the cases had been diagnosed with comorbidity. Anaemia (18.1%), hypertension (16.9%) and type 2 diabetes mellitus (12.0%) were the most prevalent comorbidity among females, while among males, type 2 diabetes mellitus (15.0%) and chronic obstructive pulmonary diseases (11.5%) were the most common comorbidity (Table 3). As seen from Fig 2, the highest percentage of cases with comorbidity were reported from those in the third (27.4%) and fourth (25%) decades of their lives. Only 5.5% of the comorbid cases belonged to the elderly age group above 60. Also, comorbidities were less reported among adolescents (3.7%).

Discussion:

Individuals with numerous coexisting conditions which are now the norm rather than the exception, require more attention in health care. This realisation has led to an increase in practitioners' and academics' interest in the influence of comorbidities on various outcomes, including mortality, health-related quality of life, functioning, and healthcare quality. Attempts to research the impact of comorbidity are hampered by a need for more agreement on how to define and quantify the notion.⁴ The present time-bound hospital-based prospective study was conducted to determine the prevalent comorbid conditions among patients attending both the elective and emergency setup of Gauhati Medical College and Hospital.

Most participants (66.67 per cent) were in the age group of 20-49 years. The findings coincide with a recent study which estimated that almost 33% of all surgical procedures are required for the Indian population aged 30-49.⁵ Almost 73.1 % of cases were males, while 26.9% were females. Most cases (69.3%) were of Islam religion.

Most of the cases (63.8%) belonged to the Lower Class. Low socioeconomic status serves as a marker for impairment and more advanced disease. Health-related quality of life is highly dependent on the patient's socioeconomic status. Poor quality of life directly impacts perioperative morbid outcomes. Various studies have reported low socioeconomic status as a significant risk factor for adverse postoperative outcomes.⁶⁻⁸ The comorbidity burden is also reported to be higher among low socioeconomic groups.^{9,10}

Chronic calculous cholecystitis was the most reported underlying disease among females (62.7%) in the present study. Gall bladder diseases and calculous cholecystitis are documented as one of the most common lesions among women of the fertile age group.¹¹ Among male participants, hollow viscus perforation (35.4%) and unilateral and obstructed inguinal hernias (23.0%) were the most typical underlying conditions needing surgery in the present study. Several studies have reported hollow viscus injuries, perforation, and perforation peritonitis more prevalent in males than females.^{12,13} Alcoholism and smoking habits among males may play a vital role in the increased risk of gastrointestinal

perforation among males.¹⁴ Out of the 309 cases included in the study, almost 53% had been diagnosed with comorbidities. Type 2 diabetes mellitus (14.2%) was one of the most common comorbid conditions among cases irrespective of gender. Patients undergoing surgery with diabetes mellitus have a higher risk of infection, postoperative complications, and in-hospital mortality.^{15,16} Anaemia (18.1%) was the most prevalent comorbidity among females. Anaemia is the most everyday haematological condition affecting over one-third of the global population, primarily women, seriously affecting human health.¹⁷⁻¹⁹ Preoperative anaemia is critical in postoperative outcomes, mortality and morbidity.^{19,20}

Chronic obstructive pulmonary diseases (11.5%) were males' second most common comorbidity. Patients with chronic obstructive pulmonary diseases had a greater chance of acquiring postoperative morbidities, including pneumonia, respiratory failure, stroke, renal failure, and wound infection.^{21,22} In the study, 11.7% of patients had preoperative hypertension (16.9%). Perioperative and postoperative hypertension increases cardiovascular and cerebrovascular activities. Persons with hypertension are at increased risk of haemorrhage and mortality. Thus, hypertensive patients must be treated before major elective surgeries.²³ It is a well-documented fact that hypertension is the most prevalent preventable medical cause for postponing surgery.²⁴

The age-specific distribution of the cases shows that comorbidities are most prevalent in the adult age group of 20-59 years. Similar results were reported by Jay F. Piccirillo et al. in their study. They found that conditions like HIV/AIDS, obesity, and illicit drug abuse were more prevalent in younger patients. In contrast, conditions such as dementia and congestive heart failure increased in prevalence and severity across the age spectrum.²⁵

Controlling comorbidities in the preoperative phase is crucial in surgery for a better outcome. Before performing elective surgery, a multidisciplinary strategy is required to prepare the case. This necessitates surgeons be well-versed in treating a wide range of comorbid diseases. It is critical to understand the initial management in case of a complication caused by the predominant comorbid condition. However, comorbid conditions cannot be treated in an emergency setting as they can in an elective setting. As a result, anaesthetists play an essential role in this area. Intraoperative communication between surgeons and anaesthetists must be seamless to address any issues resulting from the existing comorbidity. Postoperative care in intensive care units is required until the patient is stabilised.

Limitation: The present study is a hospital-based, time-bound study conducted at only one study hospital. Also, the findings presented here are part of a more extensive study. Only the preoperative observations to assess the spectrum of comorbidity among surgery patients were illustrated here. The intraoperative and postoperative outcomes of the study are not described.

Conclusion:

Comorbidities are prevalent among the study group. The adult age group is more prone to have one or more comorbidities. Anaemia and hypertension were the most common comorbid

conditions among female patients. Male surgery patients had type 2 diabetes mellitus and chronic obstructive pulmonary diseases as the most prevalent comorbidity. Multidisciplinary strategy and preoperative optimisation are necessary for planning elective and emergency surgery among patients with comorbid conditions.

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