



Orthopaedics

TO STUDY THE FACTORS AFFECTING POST OPERATIVE MORBIDITY AND MORTALITY FOLLOWING SURGERY IN ELDERLY

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ABSTRACT

As the number of Americans aged 65 years and older continues to rise, there is projected to be a corresponding increase in demand for major surgeries within this population. Consequently, it is important to utilize accurate preoperative risk stratification techniques that are applicable to elderly individuals. Currently, commonly used preoperative risk assessments are subjective and often do not account for elderly-specific syndromes that may pose a hazard for geriatric patients if not addressed. Failure to accurately risk-stratify these patients may increase the risk of postoperative complications, morbidity, and mortality. Therefore, we aimed to identify and discuss the more objective and better-validated measurements indicative of poor surgical outcomes in the elderly with special focus on frailty, patient optimization, functional status, and cognitive ability. The term 'ageing' is related to word 'senescence' although term aging commonly used to refer post maturational process that are deteriorative and lead to increased vulnerability.

However, a set of common characteristics of ageing can be identified in mammals. There are many theories of ageing, currently one theory with much emphasis is "oxidative stress model". In this hypothesis, oxygen derived free radicals formation with in the cells causes protein damage by oxidation and the pool of damaged enzymes progressively increase in size with increased age.

AIMS and OBJECTIVES To Study the commonest complications that contributes to the morbidity and mortality after abdominal surgery in elderly. To consider preventive measures that can be adopted to minimize morbidity and mortality in elderly.

MATERIALS and METHODS This prospective study was conducted in orthocare hospital Delhi from May 1st 2014 to may 2017. The most widely used scale has been the American Society of Anesthesiology (ASA) score, initially developed to classify a patient's physical status based on subjective degree of systemic disease prior to surgery rather than "operative risk". ASA score is used most commonly to give surgeons and anesthesiologists an estimate of risk of postoperative complications.

Summary and conclusion Co-morbid illness, ASA grading, diagnosis, emergency procedure, duration of operation and late recovery after operation are common factors leading to increased mortality and morbidity after surgery in elderly.

KEYWORDS : Deteriorative, Maturational, Oxidative.

INTRODUCTION

As the number of Americans aged 65 years and older continues to rise, there is projected to be a corresponding increase in demand for major surgeries within this population. Consequently, it is important to utilize accurate preoperative risk stratification techniques that are applicable to elderly individuals. Currently, commonly used preoperative risk assessments are subjective and often do not account for elderly-specific syndromes that may pose a hazard for geriatric patients if not addressed. Failure to accurately risk-stratify these patients may increase the risk of postoperative complications, morbidity, and mortality. Therefore, we aimed to identify and discuss the more objective and better-validated measurements indicative of poor surgical outcomes in the elderly with special focus on frailty, patient optimization, functional status, and cognitive ability. Malnutrition has an estimated prevalence of 23% among the elderly and is associated with several contributing factors, such as altered metabolism, decreased appetite, medication use, and chronic disease. There is currently a paucity of effective measures in place to prevent its onset; however, scoring systems have been developed as a means to evaluate patients' nutritional status. For example, models such as the Nutritional Risk Index (NRI) and the Maastricht Index utilize equations to provide objective assessments. While these tools may be reliable in identifying malnourished patients, they are fairly ineffective at determining patients who are moderately malnourished or at risk of malnutrition.

AIMS and OBJECTIVES

To Study the commonest complications that contributes to the morbidity and mortality after surgery in elderly.

To consider preventive measures that can be adopted to minimize morbidity and mortality in elderly.

To evaluate preoperative risk factors, that enhance morbidity and mortality after abdominal surgery in elderly.

MATERIALS and METHODS

This prospective study was conducted in orthocare hospital Delhi from May 1st 2014 to may 2017. All the cases were above 60yrs who underwent elective and emergency surgery between 1 may 2014 to 31

may 2017 were studied. Elective operations were performed on 56 patients and 54 patients had emergency procedure.

OBSERVATION

108 patients of 60 years or over who had operations were studied for one year period from 1 may 2014 to may 2017. 69 patients were male and 39 patients were female. Mean age was 64.95 years (60-85). Elective operations were performed on 56 patients and 54 patients had emergency procedures. 54 patients passed uneventfully with no recorded complications and other 54 patients experienced 72 complications. The most common were wound infections and chest complications. 18 patients expired and the most common cause of death was multiple organ failure with septicemia. Mean hospital stay was 15.2 days and mean postoperative stay was 10.25 days.

In this study, 70 cases were 60-69 years age group, 32 cases were 70-79 years age group and 6 patients were of 80-89 year age group. No patient was observed more than 90 years age group.

Maximum mortality rate was observed in 70-79 years age group 18.75% (6 deaths) followed by 80-90 year 16.66% (1 death), 60-69 year 15.71% (11 deaths). P value and chi square value according to mortality in different age groups was not significant.

Maximum morbidity was observed 80-89 age group, 88.33% (5 case) Morbidity present in 60-69 years age group was 48.57% (34 case) followed by 46.87% (15 case) in 70-79 years age group. P value and chi square value according to morbidity in different age group was not significant.

Maximum mean hospital stay was observed in 60-69 years age group 16.2 days (2-43) followed by 70-79 year age group 15.3 days (1-35) and 14.8 days (10-25) in 80-89 years age group.

Mean postoperative stay in 60-69 years age group was 10.45 days, 70-79 year age group was 13 days and 80-89 years age group was 12.6 days.

SEX

In 108 patients, 69 were male and 39 were female
Male : Female ratio 1.76 : 1

Mortality rate was higher in male 18.8% (13 cases) compared to female 12.8% (5 cases) (P value > 0.05, Chi square value = 0.650).

Morbidity rate was seen 53.62 % (37 cases) in male and female had morbidity rate 43.58% (17 cases) (P value > 0.05, Chi square value = 1.003)

On univariate analysis mortality and morbidity does not depend upon sex.

Mean hospital stay was more in female 16.7 days than males 14.2 days. Mean Postoperative stay in male was 11.8 days and 9.8 days in female.

DIAGNOSIS:

Mortality was higher in malignant cases 26.3% (5 cases) as compared to 14.6% (13 cases) in benign pathology. (P value > 0.05, Chi square value 1.545)

Morbidity was higher in malignant pathology 52.3% (10 cases) as compared to 49.83% (41 cases) in benign pathology. (P value > 0.05, Chi square value 0.064)

After multiple logistic regression, There was no significant difference in mortality and morbidity between benign and malignant pathology.

In 108 patients, 28.7% (31 cases) were admitted for peptic ulcer related complications and bowel perforation from malignant or benign causes 24.07% (26 cases) were admitted for bowel obstruction from benign and malignant causes. Other causes of admission were 31.48% (34 cases) for biliary disease, 4.6% (5 cases) from colorectal neoplasia, 2.7% (3 cases) non specific pain

abdomen, 2.7% (3 cases) for liver or pancreatic disease, 1.85% (2 cases) for urinary disease, 0.92% (1 Case) for acute appendicitis and 2.7% (3 cases) for miscellaneous causes.

In 108 patients, 31 patients had no co-morbid illness, they had 32% mortality (1 case) and 16.12% (5 cases) morbidity while patients with comorbid illness (77 patients) had mortality 22% (17 cases) and morbidity 63.36% (49 cases)

Mean Hospital stay was highest in patients having one risk factor 17.4 days, followed by patients having 2 risk factors 16.6 days, and 13 days in patients having 3 or more risk factors.

Mean postoperative stay was maximum 11.8 days in patients having one Pre-operative risk factor followed by 11 days in patients having no risk factor, 8.8 days in patients having 2 risk factor and 9.2 days in patients having three or more risk factors. Out of 108 patients, 105 had preoperative risk factors and most common pre operative risk factor was chronic respiratory disease (25.17%), valvular heart disease (20%) and anaemia (18%). Other were hypovoloumia, hypertension, jaundice, diabetes, malnutrition, electrolyte imbalance and acute respiratory disease.

According to duration of operation, In 108 patients, 48 patients were operated within 60 min, 34 patients were operated between 60-90 min and 26 patients were Operated taking more than 90 min.

Maximum mortality was seen in patients in whom duration was duration more than 90 min 30.76% (8/26 cases), followed by 14.7% (5/34 cases) in 60-90 min group and 10.41% (5/48 cases) in less than 60 min. group.

Morbidity was also higher in patient in whom duration of operation was more than 90 min (73% (19/26 cases), followed by 44.1% (15/34 cases) in 60-90 min group and 41.6% (20/48 cases) in less than 60 min. group.

Mortality and Morbidity was in increasing order in relation to duration of operation

In 108 patients, most of the patients (98 patients) recovery occurred spontaneously and 10 patients had late recovery.

Mortality and morbidity in late recovery group were 60% (6 cases) and 100% (10 cases) respectively. While spontaneous recovery group had mortality 12.24% (12 case) and morbidity 44.89 (44 cases).

On univariate analysis, mortality was significantly high in patients with late recovery (P value 0.001, Chi square value = 14.899) and morbidity was also (P value < 0.001, Chi square value = 11.020). Post operative complications

In 108 patients, 72 postoperative complications were observed in 54 patients. Most common postoperative complication was wound infection 22.22% followed by chest complication 19.28%, septicemia 15.2%, acute renal failure 9.8%, postoperative hypertension 4.1% postoperative fever 4.1%, diarrhoea 4.1%, abdominal distension 2.7%, bed sore 2.7%, haemoptysis 1.3%,

faecal fistula 1.3%, urinary incontinence 1.3% delirium 1.3% bile leak 1.3%, aspiration pneumonitis in 1.3%

CAUSE OF MORTALITY

In this study, 18 patients expired, most common cause of mortality was multiple organ failure with septicemia 61.6% (11 cases) followed by cardiogenic shock 22.2% (4 cases) and other were acute renal failure, acute respiratory distress, aspiration pneumonitis.

DISCUSSION

Postoperative delirium and postoperative cognitive dysfunction The process of identifying and reducing the risk of POD/POCD should continue postoperatively. Recovery room delirium is a strong predictor for post-operative delirium and so the recovery area is an appropriate area for delirium testing. High-quality peri-operative care reduces the incidence of delirium. NICE recommend that DSM-IV (Diagnostic and Statistical Manual of Mental Disorders) criteria or short-CAM (confusion assessment method) are used to diagnose delirium. Drugs that precipitate delirium, and that should therefore be avoided if possible in patients at risk, include benzodiazepines, opioids, antihistamines (including cyclizine), atropine [80], sedative hypnotics and corticosteroids. Nutrition

Nutrition should be continued from the pre-operative period or instigated early after surgery to improve wound healing and recovery; supplementation may be required. Anaesthetists can facilitate enteral nutrition by delivering age-appropriate anaesthesia and appropriate fluid therapy, avoiding reliance on postoperative opioid analgesia, and preventing postoperative nausea. Enteral nutrition improves outcome compared with parenteral nutrition in the elderly.

Re-enablement after surgery 'Re-enablement' describes patients' return to their preoperative level of function, and extends beyond remobilisation or rehabilitation. Anaesthetists contribute peri-operative components to the multidisciplinary process of a patient's re-enablement by providing appropriate care, important elements of which have been repeatedly emphasised above: age-appropriate anaesthesia; fluid therapy; thermoregulation; analgesia; communication; and risk assessment.

Ethicolegal issues A stark conclusion common to many recent reports is that hospital care disregards the dignity of older patients. This may contribute to poor continuity of care and outcome and is symptomatic of a low-quality culture of healthcare provision. Professional leadership is required to reverse these attitudes, and anaesthetists, as peri-operative physicians, are ideally

suited to managing such a change. The Working Party strongly recommends that a consultant anaesthetist within each NHS Trust is appointed Lead Clinician for

Geriatric Anaesthesia, and is encouraged to act as an 'older person's champion' within the operating department, responsible for improving the dignity and quality of care received by older patients undergoing surgery. Issues concerning mental capacity and decision-making are discussed above. These are also of importance in discussing end-of-life care with patients or their relatives/carers, when further intervention is considered either futile or high-risk to the extent that resuscitation wishes need to be considered. Advanced age traditionally has been considered a risk factor for surgery. Aging is associated with a decrease in functional reserves of organ systems and an increase in presence of co-morbid conditions. In our study, overall

mortality rate was 16.6% and morbidity 50% in patients above 60 years old while JH William and J. Colin (1988) reviewed patients over 80, 10.1% mortality and 41% at least one serious postoperative complication. Kettunen J (1995) reviewed patients aged over 65 years who were operated for acute abdomen, post operative morbidity was 26% and mortality rate 22%. Styrud J, Eruksson S (1999) studied 47 patients over 80 years, complication rate was 28% and mortality 18.5% respectively.

In our study, mortality and morbidity rate was not linearly related to age. Mortality rate in patient of 60-69 years of age was 15.7%, in patient aged 70-79 years was 18.7% and over 80 was 16.6%. Barlow AD (1989)¹⁰ noted aged patients over 74 years had twice the mortality than 65-74 years. Bufalari A (1996)⁹ found in his study that mortality rate of octogenarians was greater than that of younger patients (65-79 years). Nishada (2000) mortality rate of 3.3% in 65-79 years age group, 9.8% in 80 years or older. Arnel JJ (2003)² observed that Mortality rate was 19% in patients 70-79 years age group and 24% in 80 years or older.

Our study, morbidity was higher in patients more than 80 years of age and was found to be 88.33% followed by 48.57% in 60-69 years age group and 46.87% in 70-79. years age group, which was higher than Carisi A Polanazyk (2001) who observed that major post operative complications occurred in 5.7% in 60-69 years of age, 9.6% in patients aged 70-79 years and 12.5% in patients 80 years of age or older. In hospital mortality was significantly higher in patients 80 years and older than those younger than 80 years of age (2.6% and 0.7% respectively).

Espinonza R (2004)²³ In his prospective study of 45 patients aged more than 65 years old presenting with acute abdomen in emergency. In this series biliopancreatic disease was (31.1%), intestinal adhesive obstruction (17.7%), complicated abdominal wall hernia (13.7%) and complicated peptic ulcer disease (8.9%) Mortality rate was 11.1% for the surgical group over 65 years of age.

Concomitant disease is an important factor while assessing risk of surgical intervention in elderly patients. Presence of significant cardiac, respiratory or renal disease markedly increases preoperative risk. The presence of significant disease, dementia or previous stroke or other active medical conditions such as cancer, diabetes mellitus and sepsis are important prognostic indicators.

In our study, normal patients (No co-morbid illness) had mortality of 3.2% and morbidity 16.12%. While patients with co-morbid illness had mortality 22% and morbidity 62% (P value < 0.05, $\chi^2=5.65$, $P<0.001$, $X^2=19.953$), which was lower than Denny and Denson (1972)¹⁹ who studied on 90 year or above he observed 5% mortality in normal patients and 45% in patients with co-morbid illness.

ASA status is predictor of mortality and morbidity in elderly with comorbid illness. ASA III and IV had higher mortality (55% 0) and morbidity (90%) than ASA I and II with mortality (7.9%) and morbidity (40.9%) respectively.

Hosking et al (1989)²⁶ noted in series of 795 patients over the age of 90, mortality rate of 17.4% after emergency operation and 6.8% in elective Operation. Perioperative morbidity was significantly higher in emergency group 20.7% and 7.5%. JH William and J Colin (1989)³¹ studied patients aged 80 year and older, the overall mortality rate was nil for patients admitted for elective general procedures and 21.6% admitted for emergency surgery. Hirashima T (1992)²⁷ reported that patients over 60 years of age had mortality rates significantly higher in emergency group (11.9%) as compared to mortality rate in elective abdominal surgery group (3.8%). Madson MR (1993)⁴⁴ studied that in patients aged 80 years or more, emergency operation significantly increased both morbidity and mortality, which varied from 8% and 0% respectively after elective laprotomy, as compared to 71% and 39% after emergency Operations. Akoh IA (1994)⁴ reported 30 days mortality rates for elective and emergency Operations to be 11% and 25% respectively with in 30 days. Cheng KW (1994)⁷ studied retrospectively in 294 patients aged 80 and Older. Mortality rate

were 13.8% in emergency group and 2.5% in elective group. Roseano M (1997)⁵⁷ studied patients aged 70 years and over, the overall mortality rate was 600 after elective surgical treatment and 48% in

emergency surgery. AsCanelli S. Navarra G (2003)², reported that 30 days operative mortality was higher in emergency group (11.9%) as compared to elective group (3.4%) The 30 days Operative morbidity was also Observed higher in emergency group (27%) as compared to elective group (127% 0) Crondon IW (2005)⁷ analysed in patients aged 60 years or Older, the overall mortality was 3.7% in elective groups and 13.5% in emergency groups.

Summary and Conclusion

Beta blockers should be continued around surgery and administered perioperatively to high risk individuals undergoing intermediate or high risk surgery as outlined by the American College of Cardiology Foundation/American Heart Association guidelines. Indiscriminate and wide spread use of beta blockers is not recommended.

Statins in the perioperative period are indicated in patients with high risk indices undergoing intermediate and high risk surgery. Perioperative statin use should not be abruptly discontinued in the perioperative period.

Preoperative ECGs are indicated in patients with cardiac risk factors and active disease under going at least intermediate surgery. Age based criteria for patients undergoing low risk surgery is not recommended to guide ordering of preoperative ECGs.

BIBLIOGRAPHY

1. American society of Anesthesiologists : New classification of physical status Anesthesiology, 24:111 :1963.
2. Arnal J J. Mortality associated with emergency Abdominal surgery in elderly can J. Surgery. 2003 Apr; 46(2) 111-116.
3. Arnal J ; Concejo MP : Intestinal obstruction in the elderly Prognostic factor of mortality Rev Esp Enferm Dig. 1999 Dec ; 91(12) 838-845.
4. Akoh JA, Mathew AM : Audit of Major gastrointestinal surgery in patients aged 80 years or over. J. R. Coll Surg Edinburg 1994 Aug; 39 (4) 208-213.
5. Ascanelli s, Navarra G : Early and late out come after surgery for colorectal cancer : Elective vs emergency Surgery : Tumori 2003 Jan-Feb; 89(1) 36-41.
6. Brook B, Surgery in Patients of advanced age Ann Surgery. 105 : 481-495 1937.
7. Bahadir Kulah, Emergency hernia repairs inn elderly. A.J.S. 182 (2001) 455-459.
8. Belloma R, Gold Smith D : Prospective controlled trial of effect of medical emergency team on post operative morbidity and mortality rates. Crt care Med 2004 April ; 32 (4) 916-921.
9. Bufalari A, Ferri M, Coap : Surgical care in octogenarians. 3.1.8. 1996 Dec ; 83 (12) 1783-1787.
10. Barlow AP, zarifa Z : surgery in geriatric population. Ann R coll Surg Engl 1989Mar; 71 (2) 110-114.
11. Beenen E, Simons MP : Determinants of Hospital mortality in surgical patients aged 80 and over. Ned Tjdschr Geneesk. 2003 Sep 27; 147 (39) 1915 - 1918.
12. Bosshardt TL : Outcome of ostomy procedure in patients aged 70 years and older. Arch Surg 2003 Oct; 138 (10) : 1077-1082.
13. CA Palmer, H Reecesmith and I Taylor : Major abdominal Surgery in the over eighties. Journal of the royal society of medicine 1989 Vol 82 Issue (7) 391-393
14. Caterinos, Cavallini M 2 Acute abdominal pain in emergency surgery : Clinical epidemiologic study 450 Patients. Ann Ital Chir. 1997 Nov-Dec ; 68 : 807-817.
15. Cheng Kw, wang CH : out come of surgery and anaesthesia in patients 80 years of age and older. Acta Anaesthesiol sin 1994 Mar ; 32 (1) 37-43.