

Clinical Profile and Post Operative Outcome of Geriatric Patients: A Descriptive Study

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Abstract: *Introduction: Longevity has increased during this century so that survival beyond age 60 has become common in India. With this, geriatric associated problems and surgeries are on the rise. Doctors and hospitals are caring for a substantial and rapidly growing number of elderly patients. Decision-making about surgery for elderly patients is complicated and difficult. Limited information is available regarding surgical outcomes for patients in age group more than 60 years in Indian subcontinent. Due to ethnicity, work culture and socio – demographic variables, accurate risk prediction and surgical outcome in Indian geriatric population is not well understood. Aim: Clinical profile and postoperative outcome of geriatric patients in a general surgery unit of a tertiary care hospital. Objective: 1. To study the clinical profile and clinico-pathological spectrum of comorbid conditions and potential risk factors in the geriatric general surgical patient at a tertiary care centre. 2. To assess the surgical outcome in geriatric patients. Result: In this study, highest numbers of patients (60 %) were in the 60-69 years age group and the second highest (22%) in 70-79 years category. In total, patients ranging from 60 years to 89 years comprised 92 % of the study population. This finding is consistent with the facts that mean life expectancy in India in 67.4 years. This finding again is consistent with the worldwide trend, where in mean life expectancy is 71 year. The gender distributions of the cases were male 71% and female 29% of cases. The frequency of Co morbidities occurring in this study is primarily consist of Diabetes 22 % and Hypertension 39%. Also Smoking and alcohol play a pivotal role in the form of 20% and 41% of the assessed population. As per ASA Criteria 34% of patient fit to ASA I, 46% to ASA II, 10% to ASA III, 06 % to ASA IV and 4 % to ASA V. After applying multivariate logistic regression analysis Multivariate logistic regression analysis revealed ASA classes II, III, IV and V compared to ASA class I, to be a significant, independent risk factor for complications , post op Morbidity and Mortality. In No Morbidity group (ASA class IV: odds ratio [OR] = 3.58, , P = .04; ASA class V: OR = 3.41, P = <0.001), Mild Morbidity group (ASA class IV: odds ratio [OR] = 3.34, , P = .044; ASA class V: OR = 3.31, P = <0.001) Moderate Morbidity group (ASA class IV: odds ratio [OR] = 6.42, , P = .03; ASA class V: OR = 5.89, P = <0.01), Severe Morbidity group (ASA class IV: odds ratio [OR] = 2.52 , P = 0.03; ASA class V: OR = 3.41, P = <0.001) Mortality group (ASA class IV: odds ratio [OR] = 10.11, , P = .02; ASA class V: OR = 11.42, P = 0.01). Conclusion: 1. It has observed the relationship of age range, fraility and cognition etc in predictable outcome in Indian geriatric population. 2. It has brought out the clinical profile of geriatric cases and post operative observed outcome Vs Predictive Outcome.*

Keywords: Geriatric Patient, Surgical Outcome, Indian Geriatric, Surgery in Elderly

1. Introduction

Longevity has increased during this century so that survival beyond age 60 has become common in India. With this, geriatric associated problems and surgeries are on the rise(1). Doctors and hospitals are caring for a substantial and rapidly growing number of elderly patients. Decision-making about surgery for elderly patients is complicated and difficult. Limited information is available regarding surgical outcomes for patients in age group more than 60 years in Indian subcontinent. Due to ethnicity, work culture and socio – demographic variables, accurate risk prediction and surgical outcome in Indian geriatric population is not well understood

At the present time, more than 75% of people older than 65 years have at least one chronic condition, and 20% of patients have multiple chronic conditions(2). Geriatric patients represent a unique surgical challenge due to the complexity of comorbid conditions coupled with the physiologic changes that occur with ageing. Physiologic age is of greater importance in perioperative management of elderly surgical patients than chronologic age because it takes into account the burden of comorbid disease.

The elderly patient is intrinsically more complex and challenging than the equally ill youngster. The young

patient typically has one disease – complications and medication are few. The older patient classically has multiple conditions and a long list of medications, co-conspirators that blur the diagnosis and complicate the therapy. Laboratory values in young patients have established norms developed in young People(3). Normal ranges for the elderly are much less reliable, often guesses, appropriated with little testing from a much younger age group(4). Family responsibility for the young patient has a well-defined societal pattern whereas family links to the elderly patient are very variable and may require high level diplomacy. Yet, optimal outcomes for the young patient and for the old often require skillful and energetic family involvement.

Medical decisions with an elderly patient require professional skills at their best. The physician may start with an evidence-based algorithm conceived on experience with younger patients but the plan needs to be custom made for the particular patient at hand(5). In addition to deciding which tests and which surgery should be done, an important part of the care is deciding which tests and which surgery should not be performed. Even when a patient fulfills all the criteria for surgery, good judgment may modify or veto that decision for an elderly patient (6).

Therefore there is a need of study to quantify the surgical variables in geriatric age group in Indian context and

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appropriately predict the outcome of surgery to minimize morbidity and mortality, be helpful to optimize healthcare resources and increase quality of life of the geriatric surgical patient.

Aim and Objectives

Aim

- Clinical profile and postoperative outcome of geriatric patients in a general surgery unit of a tertiary care hospital.

Objectives

- To study the clinical profile and clinico-pathological spectrum of comorbid conditions and potential risk factors in the geriatric general surgical patient at a tertiary care centre.
- To assess the surgical outcome in geriatric patients

2. Materials and Methods

This study is a prospective observational study carried out at a tertiary level teaching hospital after due approval of the Institutional ethical committee. The study duration is from October 2017 to October 2018. The annual average number of geriatric patient undergoing surgery at a general surgery unit was calculated for sample size. The annual average was 101, thus the sample size for this study with study period of 1 year was set as 100 cases. 100 consecutive geriatric patients, who presented to this hospital during this duration, were included in the study.

Inclusion Criteria

- Age >60 years
- Sex: Both Male and Female
- Procedures performed under general anaesthesia, spinal anaesthesia
- Surgical procedures undertaken by general surgery unit

Exclusion Criteria

- Age < 60 years
- Procedure performed under local anaesthesia
- Primary surgical intervention by CTVS, Neurosurgery, Urology
- Patients unwilling for surgery

All the patients who were fitting into the study criteria were admitted, detailed history was recorded and meticulous examination was performed on all these cases. Clinical parameters, routine laboratory investigations, chest X-ray and ECG were recorded during pre-operative evaluation. Outcome Patients were analysed for their outcome at discharge, at one month post operatively and at six months after surgery. The outcomes were then clinically analysed and classified as;

- No morbidity: Expected post-operative course, discharged to home without delay, overall desirable result of surgical procedure.
- Mild morbidity: Mild complications resulting in

institution of specific management in addition to usual post-operative care for the given procedure. However no prolongation of admission and achievement of overall desirable result of surgical procedure.

- Moderate morbidity: Post-operative complications requiring specific interventions, prolonged post-operative hospital stays than usual. However overall desirable result of Surgery without permanent sequelae of complications.
- Severe morbidity: Post-operative complications requiring specific interventions and prolonged post-operative recovery with persisting residual sequelae of the complications. Overall surgical results not optimal.
- Mortality: All the details obtained from the 100 cases were tabulated and were used for data analysis.

The statistical analysis of the entire data was done using Statistical Package for Social Sciences (SPSS ver 21.0, IBM Corporation, USA) for MS Windows. In the entire study, the p-values less than 0.05 was considered to be statistically significant. All the hypotheses were formulated using two tailed alternatives against each null hypothesis (hypothesis of no difference).

3. Results and Observations

1) Distribution as patients as per age and sex:

As per the study data, most number of patients were in the age group of 60 to 69 years (n= 60), 70-79 year (n= 22), 80-89 years (n=10) and 90 and above (n=08). In this study, majority i.e. 71 % patients were males.

Table 1: Age group distribution

Age Group (years)	Frequency
60-69	60
70-79	22
80-89	10
90 above	08
Total	100

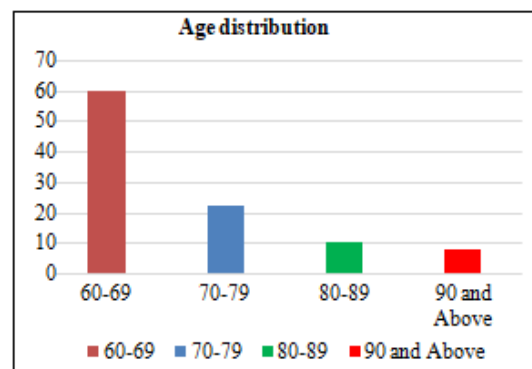


Figure 4: Age group distribution

Table 2: Gender distribution

Gender	Frequency	% of cases
Male	71	71
Female	29	29
Total	100	100

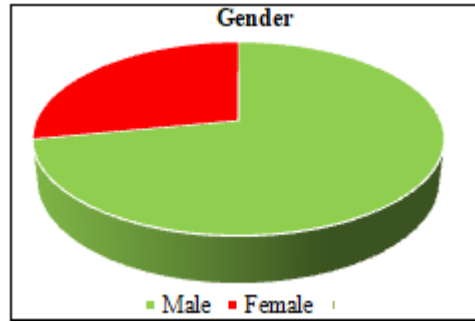


Figure 5: Gender distribution

2) Frequency of various comorbidities amongst the cases

Comorbidites considered for the case were as follows.

Table 3: Frequency of various clinical parameters

S.No.	Clinical Parameter	Frequency	% of cases
1.	Diabetes	22	22
2.	Hypertension	39	39
3.	Ischemic Heart Disease	12	12
4.	COPD	5	5
5.	Smoking	20	20
6.	Alcohol	41	41
7.	Substance Abuse	2	2

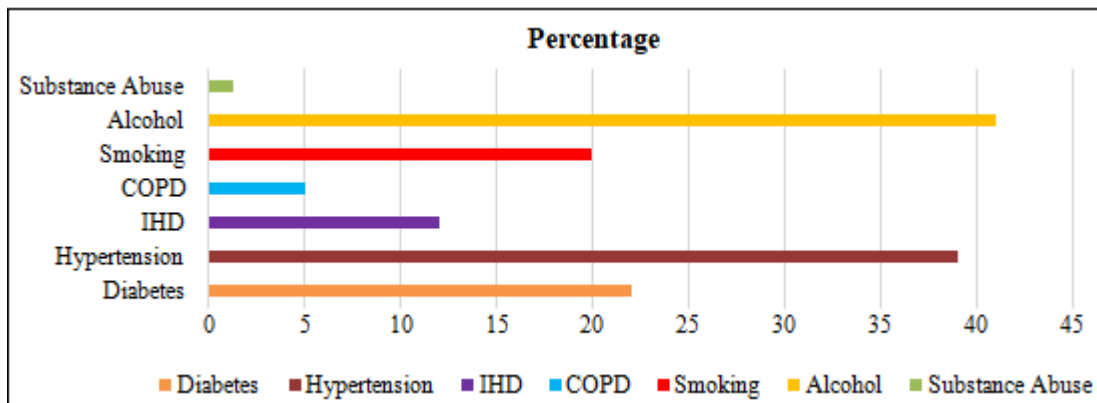


Figure 6: Graphical representation – frequency of various co-morbidites

3) Prediction as per Scoring Systems

ASA Classification: 34 Patient were Classified as ASA I, 46 as ASA II, 10 as ASAIII, and 06 as ASA IV and 04 as ASA V..

Table 4: Categorisation of cases as per ASA Classification

ASA Classification	No. of cases	% of cases
ASA I	34	34
ASA II	46	46
ASA III	10	10
ASA IV	06	06
ASA V	04	04
Total	100	100.0

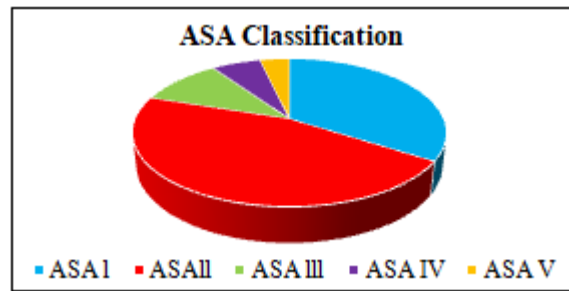


Figure 7: Graphical representation of ASA Classification

a) Observed Outcome

Table 8: Observed Outcome

Observed Outcome	Total no of cases	Percentage of Cases
No Morbidity	76	76
Mild Morbidity	12	12
Moderate Morbidity	06	06
Severe Morbidity	02	2
Mortality	04	4

4. Statistical Analysis

1) ASA Classification

Table 9: Multivariate Logistic Regression Results for ASA Class as a Risk Factor for Outcome in Surgery

Outcome	ASA Class	Odds Ratio	P-value	C-Statistic
No Morbidity	ASA II vs ASA I	1.36	0.19	0.78
	ASA III vs ASA I	1.89	0.07	
	ASA IV vs ASA I	3.58	0.04	
	ASA V vs ASA I	3.41	<0.001	
Mild Morbidity	ASA II vs ASA I	0.93	0.76	0.77
	ASA III vs ASA I	1.54	0.32	
	ASA IV vs ASA I	3.34	0.44	
	ASA V vs ASA I	3.31	<0.001	
Moderate Morbidity	ASA II vs ASA I	1.78	0.57	0.77
	ASA III vs ASA I	3.18	0.25	
	ASA IV vs ASA I	6.42	0.03	
	ASA V vs ASA I	5.89	0.01	
Severe Morbidity	ASA II vs ASA I	1.32	0.26	0.08
	ASA III vs ASA I	1.69	0.20	
	ASA IV vs ASA I	2.52	0.03	
	ASA V vs ASA I	3.41	<0.001	
Mortality	ASA II vs ASA I	3.97	0.17	0.66
	ASA III vs ASA I	5.91	0.07	
	ASA IV vs ASA I	10.11	0.02	
	ASA V vs ASA I	11.42	0.01	

5. Discussion

Surgery in geriatric age group is a highly challenging one. With the progress of time and aging population the numbers of surgeries is on the rise(34). The Traditional perioperative risk assessment measures may often overlook subtle geriatric-specific syndromes that translate into increased vulnerabilities for older patients (35).

In current medical practice, patients scheduled to undergo elective surgery are evaluated preoperatively to assess the patients' risk of adverse postsurgical outcomes given their frailty and underlying medical conditions.

Since the first scientific attempt to predict postoperative outcome in early 50s, multiple predictive scoring systems have been developed and validated(36). Most of these preoperative assessment tools rely on existing comorbidities, exercise tolerance, and lab parameters to predict postoperative outcomes. Since most of these variables can be obtained through the patient interview and the electronic medical records, these preoperative risk tools are very easy to use and have good accuracy in predicting perioperative and post operative complications(37).

However, none of these tools considers physiological characteristics specific to elderly patients and elderly

patients of Indian subcontinent due to different sociological and environmental issues(38). In addition, the outcomes of interest that these scoring systems, focus on are primarily based on single-organ systems (eg, cardiac, pulmonary)(39). Furthermore, most of the tools currently available are unable to accurately predict outcomes such as functional recovery, or need for institutionalization; all of these are key outcomes that may help guide decision making processes specifically for older surgical patients(40).

With the aging population, it is expected that Indians more than 60 years and older will grow from 8.5 % to >20% of the total population by year 2050. More than one-eighth of all inpatient surgical procedures in the India were performed on patients aged 60 years and older in 2010, and this number is expect to triple by 2050(41). Some of the procedures done on older adults are life-saving measures (eg, cancer resection), while other surgeries are done to improve quality of life (eg, joint replacement). Having a clear understanding of postoperative recovery outcome and postoperative complication rates is important so that appropriate discussions can take place between patients, their families, and physicians, and realistic treatment goals can be set and achieved (42).

Normal age-related physiologic changes such as impaired left ventricular compliance, stiffening of the systemic vasculature, decreased lung mechanics, and reduced renal function limit the physiologic reserve of older patients and make them more vulnerable to postoperative stress and illness(43).As a result, elderly patients have higher postoperative complication rates, and it is known that surgical management is often compromised in elderly patients. Therefore in this study we analyze various easy to use calculators and scoring systems to predict post operative outcome and compare these data with actual outcome of the patients.

In this study, highest numbers of patients (60%) were in the 60-69 years age group and the second highest (22%) in 70-79 years category. In total, patients ranging from 60 years to 89 years comprised 92 % of the study population. This finding is consistent with the fact that means life expectancy in India in 67.4 years. This finding again is consistent with the world wide trend, where in mean life expectancy is 71 year.

The gender distributions of the cases were male 71% and female 29% of cases. The frequency of Co morbidities occurring in this study is primarily consist of Diabetes 22 % and Hypertension 39%. Also Smoking and alcohol play a pivotal role in the form of 20% and 41% of the assessed population.

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(ASA class IV: odds ratio [OR] = 3.58, , $P = .04$; ASA class V: OR = 3.41, $P = <0.001$), Mild Morbidity group (ASA class IV: odds ratio [OR] = 3.34, , $P = .044$; ASA class V: OR = 3.31, $P = <0.001$) Moderate Morbidity group (ASA class IV: odds ratio [OR] = 6.42, , $P = .03$; ASA class V: OR = 5.89, $P = <0.01$), Severe Morbidity group (ASA class IV: odds ratio [OR] = 2.52 , $P = 0.03$; ASA class V: OR = 3.41, $P = <0.001$) Mortality group (ASA class IV: odds ratio [OR] = 10.11, , $P = .02$; ASA class V: OR = 11.42, $P = 0.01$).

Hence, this study has brought out the following:

- 1) It has observed the relationship of age range, frailty and cognition etc in predictable outcome in Indian geriatric population.
- 2) It has brought out the clinical profile of geriatric cases and post operative observed outcome Vs Predictive Outcome.

6. Conclusion

This observational study was carried out on 100 geriatric cases that underwent surgery at General surgery unit of a tertiary care teaching hospital. The study aptly brought the clinical profile and observed outcome of geriatric patients.

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ANNEXURE

APPENDIX ‘A’

Case Record Form

Patient Particulars:

Name:
Age:
Sex:
Religion:
Address:
Income:

Chief Complaints:

History

Presenting complaints:

Co morbidities:

Diabetes

Hypertension

IHD

COPD

Smoking

Alcohol:

GENERAL SURVEY:

Height Body weight BMI

Pulse /min

Blood pressure / mm of Hg

Respiratory rate /min

Temperature

Pallor/Cyanosis/Clubbing/Oedema/ Lymphadenopathy

APPENDIX ‘A’

LAB INV

CBC

LFT

Serum proteins

RFT

Scoring Systems

- 1) ASA Classification:
- 2) Mini Cog Test score:
- 3) Frailty Index Score:
- 4) P-Possum Score:
- 5) ACS NSQIP 2016 guideline score:

Outcome Analysis

- 1) No morbidity
- 2) Mild morbidity
- 3) Moderate morbidity
- 4) Severe morbidity
- 5) Mortality

Appendix ‘B’

Consent Form

I have been invited to participate in the research project titled:

CLINICAL PROFILE AND POST OPERATIVE OUTCOME OF GERIATRIC PATIENTS : A DESCRIPTIVE STUDY

I have read the foregoing information, or it has been read to me. I have had the opportunity to ask questions about it and any questions that I have asked have been answered to my satisfaction. I consent voluntarily to participate as a participant in this research.

Print Name of Participant _____

Signature of Participant _____

Date _____

Day/month/year

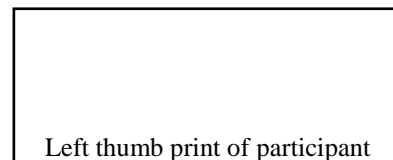
If illiterate

[Note - A literate witness must sign (if possible, this person should be selected by the participant and should have no connection to the research team). Participants who are illiterate should include their thumb-print as well]. I have witnessed the accurate reading of the consent form to the potential participant, and the individual has had the opportunity to ask questions. I confirm that the individual has given consent freely.

Print name of witness _____

Signature of witness _____

Date _____ Day/month/year



Statement by the researcher/person taking consent

I have accurately read out the information sheet to the potential participant, and to the best of my ability made sure that the participant understands that the following will be done:

- 1.
- 2.
- 3.

I confirm that the participant was given an opportunity to ask questions about the study, and all the questions asked by the participant have been answered correctly and to the best of my ability. I confirm that the individual has not been coerced into giving consent, and the consent has been given freely and voluntarily.

A copy of this Informed Consent Form has been provided to the participant.

Print Name of Researcher/person taking the consent _____

Signature of Researcher /person taking the consent _____

Date _____

Day/month/year