

Role of preoperative investigations in elderly patients undergoing oncosurgical procedures – A retrospective review audit

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Abstract

Background and Aims: The aim of the study was to evaluate the efficacy and usefulness of the current practice of various investigations and consultations being done during preanesthetic evaluation in patients undergoing oncosurgical procedures in our hospital. We also evaluated the delay caused due to these and its value in predicting postoperative complications.

Material and Methods: The preanesthetic charts of 300 elderly patients >65 years of age were reviewed, and the incidence of abnormal investigations and number of consultations advised were noted. The incidence and predictive values of these were assessed.

Results: More than half the number of patients had more than one comorbidity and were advised various consultations based on history, National Institute of Clinical and Health Excellence (NICE) guidelines, and institutional protocol. Multiple visits to preanesthetic clinic were required in patients who had abnormal thyroid tests or respiratory complaints which was the main reason for delay in scheduling surgery. However, despite multiple comorbidities not more than 12.7% of the blood tests ordered were found to be abnormal. Abnormal blood tests were not significantly associated with higher incidence of postoperative complications.

Conclusion: Blood investigations do not predict postoperative complication rate and do not influence anesthetic management of elderly patients undergoing oncosurgical procedures but are rather influenced by surgical procedure and presence of comorbidities. Hence, preanesthetic clinic should assess patients based on other predictive tests rather than relying on blood investigations alone.

Keywords: Blood tests, perioperative, routine

Introduction

Routine blood testing is part of any preanesthetic evaluation before surgery especially in the elderly population undergoing major oncosurgical procedures. Blood screening tests are used to detect disorders in asymptomatic patients.^[1] Ordering many blood tests may lead to a complacent attitude on the part of the anesthetist in the hope of detecting and preventing unexpected problems. In the process, delays or cancellation of planned

surgeries may occur. Based on preanesthetic investigations and history, further evaluation by specialist doctors is advised such as a cardiac or respiratory medicine.

During the past few years, usefulness of routine blood investigations has been questioned. Unexpected abnormal tests have hardly ever been a reason for a change in anesthetic or surgical technique. Studies have shown that 60% of abnormal tests discovered during preanesthetic evaluation have not led to further investigations^[2] Unnecessary repetition of tests also does not yield any benefit. A previous study among

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elderly patients undergoing noncardiac surgery found routine blood investigations to be of doubtful benefit.^[3] It leads to increased cost and unnecessary delay in scheduling surgery.^[4,5]

In this study, we evaluated the usefulness of routine blood investigations, requirement of further consultations, and delays due to these in management of oncosurgical patients. The patients presenting for oncosurgeries may have undergone preoperative chemotherapy or radiotherapy which warrants routine testing as per National Institute of Clinical and Health Excellence (NICE) guidelines and American Society of Anesthesiologists (ASA)^[1,6] which is our practice. Chemotherapy or radiotherapy can have various associated complications. Delays in scheduling oncosurgical cases can alter the stage and the prognosis of patients with malignancies. We also evaluated the diagnosis of new illnesses during preanesthetic evaluation.

Material and Methods

A retrospective observational study was conducted after approval of institutional review board during the period from October 2014 to September 2015. Records of 300 patients (sample size based on previous studies) older than 65 years of age were chosen randomly for the study. Since it was a retrospective study, informed consent was waived. Preanesthetic charts were reviewed. The incidence of abnormal tests and new illnesses detected were noted. Each preoperative risk factor was tested independently using univariate analysis for occurrence of postoperative adverse events. Continuous variables were analyzed using logistic regression for their association with postoperative adverse outcomes. The total number of visits required by the patients was also noted and hence any delays in scheduling of the cases.

Results

We analyzed the records of 300 patients who underwent surgeries for oral cancer which included neck dissections and flap reconstructions, gynecological procedures for cancer of ovaries, endometrium, or cervix, modified radical mastectomies, and gastrointestinal surgery for esophageal and rectal malignancies. The records were those of the first 300 patients who came for surgery who satisfied the selection criteria (above 65 years). The demographic data are given in Table 1. The comorbidities found were hypertension ($n = 206$), diabetes mellitus ($n = 80$), coronary artery disease ($n = 38$), and a history of stroke ($n = 14$).

ASA IV group of elderly patients were probably too sick to undergo major oncological surgeries and hence

only six patients were in this group. Only six cases were done as emergency procedures. Four patients underwent surgery twice during the 1-year period. Four cases were cancelled – one due to preoperative arrhythmia (despite the fact that all blood investigations were normal) and the others due to recurrent chest infection. (They hence received alternative treatment.)

The number of preanesthetic clinic visits included the day of admission. More than three visits were required in 36 patients either for treatment of respiratory infection or control of thyroid status.

Hypertension was the most frequently detected illness of new onset (46 patients of the 76 who were diagnosed with one or other illness).

Table 1: Demographic data

Variable	Percentage
I] Gender	
Male	53.3
Female	46.6
II] Age (Years)	
<75	70.67
>75	29.33
III] ASA Grade	
ASA I	10
ASA II	58.7
ASA III	29.3
ASA IV	2
IV] Number of visits to PAC	
2	25.3
3	62.7
>4	12
V] Surgery risk	
CLASS I	13.33
CLASS II	53.33
CLASS III	33.34

Table 2: Investigations

Investigation	Normal		Abnormal		Not done	
	n	%	n	%	n	%
Hemat	144	96	6	4	-	-
LFT	132	88	10	6.67	8	5.33
RFT	135	90	15	10	-	-
RBS	107	71.33	43	28.67	-	-
ELECTR	138	92	11	7.33	1	0.67
TSH	129	86	20	13.33	1	0.67
XRC	111	74	39	26	-	-
ECG	109	72.67	41	27.33	-	-
2D Echo	104	69.33	43	28.67	3	2
PFT	26	63.41	15	36.59	-	-

Hemat-Complete blood count; LFT-Liver function tests; RFT-Renal function tests; RBS-Random blood sugar; Electr-Serum electrolytes; TSH-Thyroid stimulating hormone; XRC-X ray chest; ECG-Electrocardiogram; 2D Echo-2D echocardiography; PFT-Pulmonary function tests

Table 3: Postoperative complications

	Frequency	%
Valid		
0	260	86.7
1	40	13.3
Total	300	100.0

Table 4: Number of comorbidities

Number of comorbidities	Number of patients
No. of comorbidities	60
1	82
2	110
>2	48
Total	300

Table 5: POC × age

	Crosstab		Total
	Age (years)		
	<75	≥75	
POC			
0			
Count	186	74	260
% of Total	62.0%	24.7%	86.7%
1			
Count	26	14	40
% of Total	8.7%	4.7%	13.3%
Total			
Count	212	88	300
% of Total	70.7%	29.3%	100.0%
	Chi-square tests		
			P
Pearson's Chi-square			0.550

Surgery risk I included patients undergoing low-risk procedures such as superficial procedures and breast surgery. Surgery risk II was the intermediate risk procedures including head and neck surgery, intraperitoneal, and intrathoracic surgery. Group III included major emergency surgery and prolonged procedures such as Whipple's surgery associated with large fluid shifts.

Even though patients were assessed by an anesthesiologist in our institution, preoperative test orders were not individualized but ordered by surgical team based on clinical pathway for the proposed surgical procedure. After clinical history and examinations, patients were referred to specialists for further consultation. As a routine, all elderly patients (>60 years) were referred for cardiology consultation. Pulmonology consultation was advised only if a patient had respiratory symptoms, had bleomycin chemotherapy, or a thoracotomy was planned. Other consultations were based on abnormal findings on examination or investigations.

The details of abnormal blood tests detected are given in Table 2. None of the ASA I patients had any abnormality detected in blood tests. About 168 tests out of 1008 blood tests done on ASA II group of patients were abnormal (12.7%).

12.7% of patients had thyroid abnormalities detected which delayed surgery due to requirement of optimization of TSH values.

Only 28.67% of transthoracic echocardiography reports were found abnormal. Most patients who had abnormal findings were patients with known coronary artery disease.

Pulmonary function tests (PFT) was abnormal in almost half (48.4%) of patients in whom PFT was ordered. However, pulmonology evaluation was required only in 82 patients.

HIV/HCV/HBsAg and grouping cross matching are part of routine screening. Only one abnormality was detected in this.

About 28.7% ($n = 86$) of patients had abnormal random blood sugar (RBS) values, of which 79% ($n = 68$) were known diabetics. Twelve patients were diagnosed with new-onset diabetes. Six of the values were false-positive.

13.3% patients had postoperative complications [Table 3]. Sixty patients had no co morbidities. Approximately 36.65% of the patients had at least two comorbidities and 16% had >2 comorbidities [Table 4].

Discussion

We found a high percentage of abnormalities in all the investigations (>5%) which was quite different compared to a previous study^[3] (except hematological parameters 4.3%). This may be because oncosurgical geriatric patients represent an entirely different subset compared with other geriatric general surgical populations. However, the rate of postoperative complications was much less and did not correlate to the abnormal blood investigations which are similar to previous studies.

The existence of multiple systems of medicine and perception that indigenous systems are harmless is another major factor in India. Some of the seemingly "harmless medications" could cause deranged kidney functions which could only be detected through blood tests.

A previous study by Smetana and MacPharson has found low prevalence of abnormal blood investigations in geriatric population undergoing ambulatory surgery as this represents generally healthy patients.^[2] Previous recommendations have suggested no benefit of preoperative laboratory testing in elderly

patients undergoing cataract surgery.^[5] Exercise tolerance is a simple but valuable tool to assess cardiopulmonary reserve in patients undergoing stress of surgery.

ASA grading of most of our patients was ASA 2 and 3 which was almost similar to a previous study.^[2] Inter-rater variability has been observed in ASA – Physical Status (PS) assessment. Surprisingly we found a high proportion of asymptomatic patients with thyroid abnormalities (12%) probably reflecting a rising trend in incidence of thyroid abnormalities among elderly people in the Indian subcontinent as found by Unnikrishnan *et al.*^[7] Hypertension was the most frequently detected illness of new onset, probably because of anxiety induced by diagnosis of malignancy. A good preanesthetic evaluation also allays anxiety in patients.^[8] Blood pressure is an indirect measure of anxiety in patients awaiting surgery.^[8] Whether patients detected with preoperative hypertension could be counseled further to reduce stress and anxiety also needs to be addressed. Probably the turnover rate of patients in preanesthetic clinic is a deterrent to this in our institution.

Our overall complication rate was similar to the 10% found by Smetana and MacPharson.^[2]

Our results show that blood investigations do not alter the plan of anesthesia or predict risk of complications. Abnormal 2D Echo and PFT reports did not predict occurrence of postoperative complications (not statistically significant). ECG and X-ray chest abnormalities did not significantly alter the intraoperative or postoperative management of patients which was based mainly on history and surgical risk stratification. A previous study has reported occurrence of ECG abnormalities in 75.2% of patients above 80 years of age.^[9] Abnormalities on preoperative ECG are common but are poor predictors of postoperative cardiac complications.^[10] . Abnormal chest radiographs are common, but fewer than 5% abnormal results were found to alter the management intraoperatively.^[9] Preoperative chest radiograph was one of the most frequently ordered preoperative investigations with about 65% showing abnormalities which is much higher than our finding. We found that increasing age was not associated with abnormalities in ECG or chest radiographs. Metastatic work-up of patients could reduce the need to order preoperative chest radiographs.

A previous study in 1026 ambulatory surgical patients has shown that routine preoperative testing did not reduce the incidence of adverse events during and up to 30 days after surgery.^[11] Can this be extrapolated to oncosurgical elderly patients undergoing low-risk procedures? These patients could be admitted on the day of surgery. They are usually discharged the next day in our institution. Can we reduce the number of tests ordered for them? This is a change which we could consider.

Evidence to show proper utilization of preoperative echocardiography is weak. It has not been found to be associated with postoperative complications. The British Society of Echocardiography and the American Society of Echocardiography have established guidelines on use of echocardiography for preoperative assessment.^[12,13]

Correll *et al.*^[14] concluded that proper risk assessment and optimization of medical conditions in the preoperative clinic may be major factors contributing to reduction in cancellations and delays on day of surgery. This method is adopted in our institution. We had only two cancelled cases. Only 18 patients required more than three visits for optimization of their medical conditions. New problems had a greater probability of delay (10.7%) or cancellation (6.8%) than old problems (0.6% and 1.8%, respectively). Obtaining old records and test results have been known to require multiple visits to preanesthetic clinic. They detected 17% new medical problems.

Postoperative complications included wound infections, cardiac and postoperative pulmonary complications. Minor complications included hyponatremia and paralytic ileus [Table 5].

Limitations

Costs incurred due to additional tests were not calculated as many patients are treated free of cost. It is a retrospective observational study, and hence no changes could be done during the study period.

Recommendations

1. It would be a useful approach to order investigations based on history and physical examination rather than order an investigation package. ASA I patients probably do not benefit from blood investigations. Age is not a reason to order blood tests. Physically active geriatric population should be clinically examined rather than ordered to undergo X-ray chest or ECG.
2. We recommend the addition of TSH as a screening tool for all patients coming for surgery.
3. In patients with long-standing diabetes, HbA1C is more predictive of morbidity as per recommendation which is not part of our practice. This can be implemented.
4. Whether physician referral could have decreased the bulk of patients being referred to the cardiologist is also a matter of concern which needs to be addressed. Not all patients referred to cardiologist had an abnormal ECG.
5. Elderly patients probably should be assessed using other tools for prediction of postoperative complications such as Katz Activities of Daily Living index or National Surgical Quality risk calculator.
6. Trained staff or psychosocial workers could help in preoperative clinic for counseling and psychologically preparing patients for major procedures.

- Maintaining computerized records of all patient details would make it readily accessible.

Conclusion

Preanesthetic evaluation of a patient is useful in determining fitness of a patient based on clinical examination and history. However, blood investigations should be ordered as required by the anesthetist. In our study, thyroid abnormalities were the most frequently abnormal laboratory investigation. For most patients in developing nations, surgery may be the first reason to visit a hospital due to absence of widespread social security measures. Anesthesiologists sometimes resort to consultations as defensive practice to avert possible litigations. The changing role of anesthesiologists as perioperative physicians can probably avoid requirements for excessive consultations. The problem is thus multifaceted and practice guidelines should be evolved for every subset of patients.

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Conflicts of interest

There are no conflicts of interest.

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