



Preoperative Investigations in ASA I and II Patients – Do We Really Follow Recommendations?

Authors

Sapna Annaji Nikhar¹, Kavitha Jayaram²

¹Assistant Professor, Department of Anaesthesiology and Intensive Care, Nizam's Institute of Medical Sciences, Hyderabad, 500082, India

²Assistant Professor, Department of Anaesthesiology and Intensive Care, Nizam's Institute of Medical Sciences, Hyderabad, 500082, India

Email: drkarunya@gmail.com

Corresponding Author

Dr Sapna Annaji Nikhar

Assistant Professor, Department of Anaesthesiology and Intensive Care,

Nizam's Institute of Medical Sciences, Hyderabad, 500082, India

Email: sapnanikhar@gmail.com, Telephone: +91 9030460262

Abstract

Background: Pre-anaesthetic check up (PAC) is to assess the clinical condition of patient and advice necessary investigations. This ultimately helps in risk stratification of patients. Though there are recommendations for evaluating patients, it is not getting followed and investigative modalities are increasing and clinical touch is lacking. We aimed to show that the preoperative investigations needed to optimize patients for surgery are exceeding the recommendations.

Methods: We carried a prospective, observational study in 200 ASA I and II patients, of either sex or any age group. The record of the investigations was done which was already advised and any advice further given by senior anaesthesiologist.

Results: Though ASA I and II patients do not need most of the investigations, CBP, SE, RFT, coagulation profile, ECG and CXR were advised already by surgeons, in almost 100 % patients. TFT was already done in 15 (25%) patients of ASA II group posted for thyroid surgery, only in 5 (8.3%) patients it was needed to demand. ECHO also same way was already done in 63 (45%) patients of ASA I group and 46(76.7%) patients of ASA II group. Out of cardiology referrals, 14 (10%) was done by surgeons themselves and clearance for surgery was taken though belong to ASA class I.

Keywords: Surgery, investigations, recommendations.

Introduction

Proper and thorough evaluation of patient is very important aspect of preoperative assessment, along with clinical examination. This has led to unnecessary evaluation, trouble to the patient and also increases the budget. American Association

of Anesthesiologist (ASA)¹ has given grades to assess the patients in preoperative assessment. According to that, ASA I and II grade patients are stable or have controlled disease. So clinical judgment, along with few necessary investigations depending on comorbidity and type of surgery

needs to be sufficient to clear the patient for surgery. But now a day's investigations and referrals are overpowering and clinical touch is lagging behind. With the same thought we conducted this observational study to show that the preoperative investigations needed to optimize patients for surgery are exceeding the recommendations.

Aims and Objectives

To show that the preoperative investigations needed to optimize patients for surgery are exceeding the recommendations.

Materials and Methods

After approval from institutional ethics committee and informed consent from patients this observational study was conducted in 200 ASA I and II patients, of either sex or any age group. Patients of ASA III and IV, those posted for cardiac, long duration procedures and neurosurgeries were excluded from the study. As a routine PAC was conducted for surgery and recording was done in PAC chart by trainee anaesthesiologist. The record of the investigations was done which was already advised by surgical team and any advice further needed which was given by senior anaesthesiologist. The record of CBP- Complete Blood profile, RBS- Random Blood Sugar, SE- Serum electrolytes, RFT-Renal function tests, ECG- Electrocardiography, CXR- Chest X-ray, LFT- Liver function test, TFT- Thyroid function test, Hb1AC- Glycosylated Hemoglobin, ECHO- Echocardiography, AEC(Absolute Eosinophil's Count) was done. Also NYHA (New York Heart Association) status of the patients, MET (Metabolic Equivalents), BHT (Breath holding time), any referrals and basic vitals were recorded. The data were collected by a fixed designated anaesthesiologist for the entire duration of the study by screening PAC record sheets. However, designated anaesthesiologist did not filter out any investigations. The designated anaesthesiologist (data collector) also did not intervene to modify

the PAC process conducted by other colleague of the same rank.

Data were expressed in absolute number and percentage scale. Further statistical tests to analyse the data were done by appropriate statistical tests using SPSS 20 and $P < 0.05$ was considered as statistically significant.

Results

Out of 200, 140 were ASA I patients and 60 patients were ASA II. In ASA I group, males were 93 (66.4%) and females were 47 (33.6%), while in ASA II group, 26 were males (43.3%) and 34 were females (56.7%). Mean age was 33.96 ± 10.6 in ASA I group and 43.88 ± 11.6 in ASA II group. Most of the patients weighed between 51-60 kg with mean weight of 52.57 ± 9.42 and 56.88 ± 7.69 in ASA I and II groups respectively. 136 Patients (97.1%) of ASA class I and 40 (66.7%) of ASA II were belonging to NYHA class I. MET was > 4 METS in almost all patients and BHT was also > 20 seconds. Gender, age and weight distribution is given in Table 1, Table 2 respectively. Table 3 gives idea about type of surgeries performed. Vital parameters were recorded and though the difference in ASA I and II groups is significant, the mean values are not very high to categorize as moderate to severe hypertension (Table 4). The distribution of investigations was given in Table 5. Almost CBP, SE, RFT, coagulation profile, ECG and CXR were advised already by surgeons. LFT were done in 5 (8.3 %) patients of ASA II group as advised, TFT was already done in 15 (25%) patients of ASA II group posted for thyroid surgery, only in 5 (8.3%) patients it was needed to demand. ECHO also same way was already done in 63 (45%) patients of ASA I group and 46(76.7%) patients of ASA II group and only 14 (23.3%) patients, it was advised depending on surgery, duration of surgery, ECG findings. In terms of referrals of patients, nephrology referral was done in 2 patients (1%), pulmonology in 8(4%) patients for COPD history, cardiology in 41(20.5%) and general medicine in 14 (7%) patients for high

AEC. Out of cardiology referrals, 14 (10%) was done by surgeons themselves and clearance for

surgery was taken though belong to ASA class I. (Table 6)

Table 1:- Gender distribution of patients studied

Gender	ASA		Total
	ASA I	ASA II	
Female	47(33.6%)	34(56.7%)	81(40.5%)
Male	93(66.4%)	26(43.3%)	119(59.5%)
Total	140(100%)	60(100%)	200(100%)

Table 2:- Age distribution of patients studied

Age in years	ASA		Total
	ASA I	ASA II	
<10	4(2.9%)	0(0%)	4(2%)
10-20	9(6.4%)	1(1.7%)	10(5%)
21-30	37(26.4%)	8(13.3%)	45(22.5%)
31-40	50(35.7%)	16(26.7%)	66(33%)
41-50	37(26.4%)	19(31.7%)	56(28%)
51-60	3(2.1%)	13(21.7%)	16(8%)
61-70	0(0%)	3(5%)	3(1.5%)
Total	140(100%)	60(100%)	200(100%)
Mean ± SD	33.96±10.60	43.88±11.60	36.94±11.80

Table 3: Type of surgeries

Surgeries	Number (200)	%
Orthopedic surgery(Nailing, Plating, tumour excision)	66	33
Thyroid surgery	20	10
Parotid excision	4	2
Hernia repair	9	4.5
Breast surgery	20	10
Urology surgeries	35	17.5
Others (plastic procedures, Thigh swelling, Neurotisation)	46	23

Table 4: Comparison of Vital parameters distribution of patients studied

variables	ASA		Total	P value
	ASA I	ASA II		
PACHR	80.58±12.91	79.58±12.10	80.28±12.65	0.611
SBP (mm Hg)	121.86±13.71	129.63±12.46	124.19±13.78	<0.001**
DBP (mm Hg)	77.86±7.74	83.07±9.16	79.42±8.51	<0.001**

Table 5: Investigations distribution

Investigation	Already done		Advised	
	ASA I n = 140 (%)	ASA II n =60 (%)	ASA I n = 140 (%)	ASA II n= 60 (%)
CBP	140 (100)	60 (100)		
SE	140 (100)	60 (100)		
RFT	140 (100)	60 (100)		
RBS	139 (99.3)	60(100)		
Coagulation profile	140 (100)	60 (100)		
ECG	140 (100)	60 (100)		
CXR	140 (100)	60 (100)		
LFT				5 (8.3)*
TFT		15 (25) #		5 (8.3)#
Hb1AC				14 (23.3)^
ECHO	63 (45)	46(76.7)		14 (23.3)!

CBP- Complete Blood profile, RBS- Random Blood Sugar, SE-Serum electrolytes, RFT-Renal function tests, ECG- Electrocardiography, CXR- Chest X-ray, LFT- Liver function test, TFT- Thyroid function test, Hb1AC- Glycosylated Hemoglobin, ECHO- Echocardiography * Chronic alcoholic patients, #Thyroid disorder, ^ to assess sugar control, !Advised depending on surgery, duration of surgery, ECG findings.

Table 6- Referrals done

	ASA		Total (n=200)
	ASA I (n=140)	ASA II (n=60)	
Nephrology	0(0%)	2(3.3%)	2(1%)
Neurology	0(0%)	0(0%)	0(0%)
Pulmonology	1(0.7%)	7(11.7%)	8(4%)
Cardiology	14 (10%)*	27 (45%)	41(20.5%)
General medicine	11(7.9%)	3(5%)	14(7%)

*Referral was done by surgeons as routine

Discussion

The preoperative anesthetic checkup (PAC) is to assess individual patient and gather information to plan anaesthesia accordingly so that to have minimal or no perioperative morbidity or mortality². With the same intention, ASA classification 1941 by Meyer Saklad has come in practice.¹It gives few descriptions of the patient general health which correlates with the risk of anesthesia and surgery. According to this classification ASA I and II are the most stable patients without any end organ damage. The ASA has stated that 'no routine laboratory or diagnostic screening test is necessary for the pre-anaesthetic evaluation of patients' for ambulatory surgery in ASA I and II patients.^{3,4}In most of the patients history and proper physical examination done by trained anaesthesiologist remains the most accurate and efficient way of detecting comorbidity.⁵The unnecessary investigation adds

to cost and further delay the surgery.⁶Hence in history itself, if we are classifying them in these two classes, we can avoid unnecessary investigations.

The few investigations are advised by anaesthesiologist depending on the type of surgery and duration of surgery as surgical complications occur frequently. Hence consideration is given to type of surgery and functional capacity of patient⁷. Depending on risk stratification of surgeries and functional status of patient we can advise further evaluation.^{8,9}

The recommendations are:^{9,10}

- Hemoglobin:-It is reasonable to check hemoglobin for all patients aged 65 years or older and for younger patients undergoing surgery with expected major blood loss.
- Full blood count: Patients older than 60 and surgical severity \geq grade 2; all adults

if surgical severity \geq grade 3; severe renal disease.

C. Electrolyte determination is not routinely recommended for elective surgery in healthy individuals.

D. Urea, electrolytes and creatinine: Patients older than 50 and surgical severity \geq grade 3; all adults if surgical severity grade 4; any renal disease; severe cardiovascular disease.

E. Blood sugar estimations:- Only in certain operations, such as vascular surgery and coronary artery bypass grafting (CABG), diabetes was associated with higher perioperative risks; hence, routine blood sugar determination is recommended in such cases.^{11, 12}

F. Electrocardiography: -^{13, 14}

- Routine ECG is recommended for all patients older than 40 years undergoing elective surgery, those undergoing high-risk surgery (eg, vascular surgery) or intermediate-risk surgery and with at least one risk factor
- Routine preoperative resting 12-lead ECG is not useful for asymptomatic patients undergoing low-risk surgical procedures
- The AHA recommends ECG in all severely obese patients (body mass index ≥ 40 kg/m²) with at least one other risk factor.¹⁵

G. Chest X-ray: -routine CXR is recommended only for patients older than 60-70 years unless underlying heart or lung disease is a possibility and patients scheduled for critical care.^{16, 17}

H. Coagulation studies: -Those with bleeding disorders, renal dysfunction, liver dysfunction, and type and invasiveness of procedure.

I. LFT :- Because most patients with severe aminotransferase enzyme elevation are likely to be symptomatic, and jaundice may be detected by physical examination, routine preoperative testing (preoperative

screening) is not recommended for healthy individuals.

J. Echocardiography: -

- It is useful in asymptomatic patients with the following cardiac murmurs (diastolic murmurs, continuous murmurs, and late systolic murmurs, murmurs associated with ejection clicks, murmurs that radiate to the neck or back, grade 3 or louder systolic murmurs).
- The weight of evidence or opinion is in favor of the usefulness of echocardiography in asymptomatic patients with the following cardiac murmurs:- Murmurs associated with other abnormal physical findings on cardiac examination and murmurs associated with an abnormal electrocardiogram or chest radiograph.

Previous studies demonstrated that 60% of these patients had laboratory tests ordered for no apparent reason, and that only 0.22% of the abnormal results influenced preoperative management,¹⁸ In another study, Turnbull and colleagues¹⁹ reviewed the charts of 2570 patients undergoing elective surgery, finding that only 104 of 5003 laboratory test results were abnormal and significant, and that only 4 patients would have benefited from "routine" laboratory testing.

In recent study, Seventy-five out of 352 patients (42.67% male, 57.33% female; American Society of Anesthesiologists physical status I to III) were observed for PAC. Of them, 89.33% were subjected to at least one unnecessary investigation and 91.67% of the referral services were not required which lead to 3.5 (SD ± 1.64) days loss. More than two-third of pre-operative investigations and referral services are unnecessary.²⁰

Here we studied only ASA I and II patients only and we could similar results. In this study, CBP, SE, RFT, coagulation profile, ECG and CXR were advised already by surgeons, in almost 100 % ASA I and II cases. LFT were done in 5 (8.3 %) patients of ASA II group as advised, TFT was already done in 15 (25%) patients of ASA II group posted for thyroid surgery, only in 5 (8.3%)

patients it was needed to demand. ECHO also same way was already done in 63 (45%) patients of ASA I group and 46(76.7%) patients of ASA II group. Also most of the patients were posted for intermediate (49.5%) to low risk (50.5%) surgeries, still all investigations were advised.

Limitations

Sample size needs more to prove effectively and ascost effectiveness was not studied, it adds to the limitations of the study.

Conclusion

In ASA I and II patients, most of the investigations and referrals are unnecessary. They add to cancellation or postponement of cases. It is observed that most of the investigations are already advised by surgical colleagues; hence it is anesthesiologist duty to counsel surgeons for not writing all investigations and sending directly for PAC.

Conflicts of interest -None

Role of Funding Source – None

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