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ORIGINAL ARTICLE

Adherence on Recommended Guidelines for Pre-Operative Routine Investigations in ASA (American Society of Anaesthesiologists) Grade 1 and 2 by Anaesthesiologists working at Tertiary Care Hospitals in the Province of Sindh

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ABSTRACT

Aim: To assess adherence on recommended guidelines for pre-operative routine investigations in ASA grade 1 and 2 by anaesthesiologists.

Study Design: Cross-sectional study

Place and Duration of Study: Tertiary Care Hospitals in the Province of Sindh from 17th April 2019 to 17th October 2019.

Methodology: One hundred anaesthesiologists were enrolled. The laboratory investigations of the patients which were ordered by anaesthesiologists according to ASA Grade I & II and surgical grade I & II depending upon the age (16-60). The investigations were classified into three categories Good, Acceptable and Poor depending upon adherence to NICE guidelines.

Results: Sixty six (66%) were males and 34 (34%) were female and the median age was 31 (29-35). Only 16% were positive adherence to the NICE guidelines when ordering pre-operative routine investigations which falls under category of poor adherence while none of positive adherence fall under category of good or acceptable adherence. Traditionally, there is no recommended test for ASA I, surgery grades I & II and ASA II, surgery grade I, but the result indicates that several insignificant tests were requested in these classes.

Conclusion: Preoperative biochemical testing is widely used and enhance the effectiveness of surgery but it should be cost effective in range of the patients.

Key words: Tertiary care hospitals, Adherence, Routine investigations, Guidelines

INTRODUCTION

The preoperative assessment is an important interaction between the patient and doctor. Preoperative biochemical testing importance has already widely accepted and reviewed.[1] This facilitates the anaesthetist to assess the medical condition and overall health status of the patient and to determine risk factors if any, against the procedure.[2,3] It is generally accepted worldwide by wide number of surgeons and doctors.[4] Although there are evidence-based recommendations for which investigations should be done, clinical practice varies.[5,6] Pre-operative investigation is categorized into two groups: screening and diagnostic. American Society of Anaesthesiologists Task Force on Pre anaesthesia Evaluation (2002)[7] explained a criteria for routine test which are performed without any specific indication and symptoms.[8]

It is not commonly cost effective due to the high cost of biochemical test specifically which are performed without any specific cause.[9-14] The preoperative testing practice, for the most part, falls under the category of routine.[8] The screening tests in asymptomatic do not prove beneficial and abnormal test sometime change the outcome.[5,6,9,15-17]

Routine investigations in elective surgery are ordered following a predetermined protocol/tradition in our setup. These include haemoglobin, bleeding time, clotting time, kidney function test and chest radiography.[18] These are mainly done as a routine workup as the anaesthetist or surgeon would not proceed for procedure in their absence, and hence clinical assessment regarding these parameters is not given much importance, that in turn compromises clinical skills development, especially amongst the trainees.[12,19]

As a result each and every patient for elective surgery goes through these investigations, whether or not indicated based on clinical evaluation.[1,2] Consequently, there is an increase of workload on the laboratory, health personnel and economy. This in turn adversely affects the quality and reliability of results and at the same time, adding enormously to the costs involved.[20,21] More than often, abnormal results are doubted upon and investigations are redone from the same or mostly different laboratory in private setup that further adds to the expenses.[22,23]

The purpose to assess the practice of preoperative testing in ASA grade 1 and 2[24] patients going for minor or intermediate elective surgery[25] by anaesthetists practicing in tertiary care hospitals in Province of Sindhi and compare these results with the NICE guidelines[26] so that cost-effective preoperative evaluation can be approached from a variety of methods, educational strategies, use of data to modify clinical practice[20] and by implementing international guidelines as Nichols et al[27] found that for younger patients (<60 years), the mean number of tests decreased from 3.42±1.8 in the pre guideline group to 2.89±1.98 in the post guideline group (P=.042). The implementation of guidelines led to overall savings of US $7589 per 1000 patients, which is equivalent to (US $40,745.50 per annum).

MATERIALS AND METHODS

This cross-sectional study was conducted in tertiary care hospitals in the Province of Sindh of Karachi (The Indus Hospital, Aga khan University Hospital, Liaquat National Hospital, Civil Hospital, JPMC, SIUT, Abbasi Shaheed Hospital, Ziauddin Hospital, PNS Shifa Hospital, Patel hospital, Dow international Ojha campus, NICVD and Baqai Medical college/Hospital), Nawabshah (Peoples Medical College) and Jamshoro (Liaquat University of Medical &Health Sciences) from 17th April 2019 to 17th October 2019 and 100 anaesthesiologists currently practicing at tertiary care hospitals in province of Sindh were enrolled. All FCPS consultants, all MCPS specialists, FCPS residents of anaesthesia with a minimum of 2 years of experience working at tertiary care hospitals, those who agree to participate, either gender and age (28-70 years) were included. All MCPS trainees, primary and secondary care hospitals non-responders (not responding within 2 weeks) were excluded.

The head of department of anaesthesia of all the hospitals were contacted via email or phone for an appointment. After taking an appointment from the head of department of anaesthesia from tertiary care hospitals we take permission to conduct the survey after sharing questionnaire and the objectives for conducting this study. After getting permission we targeted those FCPS consultants, MCPS specialists and FCPS residents from

department of anaesthesia who are currently working at hospital. Those individual anaesthesiologists who are fitting into the inclusion criteria will be met by the principle investigator (PI) or team member and explain the purpose of the research survey. Those giving informed consent were given the questionnaire to fill up and return to the PI. The questionnaire is adapted from Czoski-Murray et al[28] study but some changes has been done according to recent guidelines and our setups. Multiple visits were done to the institute to ensure the maximum number of anaesthesiologists participating in the study and the questionnaire would also be sent via e mail to those not available in the institute at the time of our visit. The data was entered and analysed using SPSS-21.

RESULTS

There were 66 (66%) males and 34 (34%) females with the median age of the participant was 31 (29-35). Fifty five (55%) participants were FCPS residents with minimum two years of experience, 30 (30%) were MCPS and 15 (15%) of anaesthetist were FCPS or equivalent. Fifty four (54%) of participant had written protocol for pre operative test and 46 (46%) of participant had not written protocol whereas 52 (52%) of participant were from private hospital and 48 (48%) were from government hospital. Moreover, 53 (53%) of participant had HMIS system in their hospitals while 47 (47%) participant did not have access to HMIS. Eighty eight (88%) of participant reported that they have easy access to information in HMIS, 8 (8%) of participant reported that they do not have an easy access to information in HMIS. Twenty four (40%) participants reported that their hospital keeps patients record in record room while 36 (60%) reported that record is kept by patient in files (Table1).

~~In ASA grade I, Surgery grade I age group 16-40 only 12 (12%) positive adherence to the guidelines which falls under category of poor adherence and 88 (88%) was negative adherence to the guidelines. In ASA Grade I surgery II age group 16-40 only 4 (4%) positive adherence to the guidelines which falls under category of poor adherence and the rest is negative adherence. For both ASA grades, categorized on the basis of age and co morbidities the majority of the anaesthetist did not follow the guidelines which are negative adherence (Table 2).~~

Table 1: Descriptive statistics of the patients (n=100)

Variable	No.	%
Age		
Median IQR	31 (29-35)	
Min –Max	27 – 60	
Years of experience		
Median (IQR)	3 (2.5-5)	
Min –Max	1 – 35	
Gender		
Male	66	66.0
Female	34	34.0
Qualification		
FCPS/Equivalent degree	15	15.0
MCPS	30	30.0
Resident with minimum 2 years experience	55	55.0
Types of Hospital		
Private	52	52.0
Government	48	48.0
Written protocol for Pre-Operative testing		
Yes	54	54.0
No	46	46.0
HMIS system at hospital		
Yes	48	48.0
No	52	52.0
Does Your HMIS automatically record test		
Yes	45	44.5
No	3	3.0
Does Your HMIS record the source from which the test was ordered(Clinic)		
Yes	41	91.0
No	4	9.0
Easily accessible information		
Easy to access	88	88.0.
Not easy to access	7	7.0
Don't Know	5	5.0
How does your hospital Keep patients medical record?		
Files kept in record room	24	40.0
Files kept by patients	36	60.0

In ASA grade I, Surgery grade I age group 16-40 only 12 (12%) positive adherence to the guidelines which falls under category of poor adherence and 88 (88%) was negative adherence to the guidelines. In ASA Grade I surgery II age group 16-40 only 4 (4%) positive adherence to the guidelines which falls under category of poor adherence and the rest is negative adherence. For both ASA grades, categorized on the basis of age and co morbidities the majority of the anaesthetist did not follow the guidelines which are negative adherence (Table 2).

In ASA grade I categorized on the basis of surgery grade I, II and age, routinely there is no test recommended but our result shows that many irrelevant test were requested in these group and the most frequent tests were UCE, FBC, ECG and CXR (Table 3).

In ASA Grade II for Surgery grade I routinely no test is recommended and only for ASA grade II for Surgery grade II Cardiovascular co morbidity the guideline recommends for considering ECG only but our result shows that the guideline were not followed and after ECG the most frequent tests were FBC, UCE, CXR RBS and PT, APTT in this group. In ASA Grade II for Surgery grade II Renal co morbidity the guideline recommends UCE, urine test and ECG but with ECG, UCE and urine test, FBC, CXR and RBS were also carried out frequently. The guidelines suggest HbA1C in Diabetes only but HbA1C has been ordered for every comorbids. In ASA Grade II for Surgery grade II respiratory comorbidity, there is no test recommended but in our study almost every test has been requested and the most frequent test were CXR, ECG, FBC, UCE, PFTs and RBS (Table 4).

Table 2: Frequency of ASA Guideline status

ASA Guideline	Positive Adherence	Negative Adherence
Grade I Surgery Grade I and II Age 16-40		
Surgery I	12 (12%)	88 (88%)
Surgery II	4 (4%)	96 (96%)
Grade I Surgery Grade I and II Age 41-60		
Surgery I	2 (2%)	98 (98%)
Surgery II	-	101(100%)
Grade II Surgery Grade I Age 16-40		
CVS	-	100 (100%)
Respiratory	1 (1%)	99 (99%)
Renal	-	100 (100%)
Diabetes	-	100 (100%)
Obesity	-	100 (100%)
Grade II Surgery Grade I Age 41-60		
CVS	-	100 (100%)
Respiratory	1 (1%)	99 (99%)
Renal	-	100 (100%)
Diabetes	-	100 (100%)
Obesity	1 (1%)	99 (99%)
Grade II Surgery Grade II Age 16-40		
CVS	-	100 (100%)
Respiratory	1 (1%)	99 (99%)
Renal	1 (1%)	99 (99%)
Diabetes	-	100 (100%)
Obesity	-	100 (100%)
Grade II Surgery Grade II Age 41-60		
CVS	-	100 (100%)
Respiratory	-	100 (100%)
Renal	1 (1%)	99 (99%)
Diabetes	-	100 (100%)
Obesity	-	100 (100%)

DISCUSSION

Current study highlights that unnecessary investigation can be significantly reduced by appropriate laboratory indications. Associated factors for inquiries must be established depending on the patient's comorbidities and the complexity of the operation.

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Guidelines help to ensure that these patients are prepared for surgery with an organized, patient-directed, evidence-based approach to work. Patients in good health therefore need to undergo minimal investigations.

In ASA grade I, Surgery grade I and II age group 16-40 only 16(16%) of anaesthetist followed the guidelines and 84(84%) of anesthetist did not follow the guidelines. A total of 5879 tests were reported and evaluated by Flamm et al[23], almost 82%of the performed test is regarded as non compliance according to software-guidelines and duplicated tests.

Earlier studies have documented reducing costs following patient-directed investigations.[29-31] 63% cost reduction through the implementation of their institute guidelines.[29] Similarly, in another report, the selective ordering of anaesthesiologists investigations significantly decreased the cost up to 41%.[32]

This is generally not regarded as a good way to interpret the data. Developing countries have disadvantages on access to health care compared with developed countries. Health facilities and health-care knowledge is only confined to urban residents and limited in rural population. Need of the regular screening and biochemical tests can be minimized by adopting appropriate guidelines and diagnostic method. Based on the observation of large cohort, regular ECG and chest X-rays is usually not recommended.[33-35]

Likewise, regular ECG screening would not prove to be a useful indicator for those patients who developed cardiac complications later in their lives despite of the normal ECG history.[36] Unnecessary tests before surgery many times leads to anxiety in patients, cause delay in surgery and prove to be a cause of false positive results.[37]

Majority of the research suggests that, pre-operative screening can only be adopted in patients that already had underlying disease conditions including older patients, cardiac complications, respiratory disorders and other comorbidities.[38] Most of the anesthetists, almost 48% found routine tests to be unnecessary and unworthy.[38,39] Limited data is available to address the issues of Pakistani population.

Table 3: Frequency of the pre operative tests in ASA Grade I, Surgery Grade I and II

Age (Years	CXR	ECG	Heamostasis	UCE	FBC	RBS	Urine
ASA Grade I, surgery grade I,							
16-40	22 (25%)	7 (8%)	17 (19%)	43 (48%)	82 (92%)	23 (26%)	11 (12%)
41-60	62 (62.6%)	87 (87.9%)	27 (27.3%)	83 (83.8%)	92 (92.9%)	45 (45.5%)	17 (17.2%)
ASA Grade I, surgery grade II,							
16-40	43 (44%)	24 (25%)	32 (33%)	70 (72%)	91 (94%)	36 (37%)	16 (17%)
41-60	84 (83%)	98 (97%)	47 (47%)	96 (95%)	94 (93%)	61 (60%)	24 (24%)

Table 4: Frequency of the Pre operative tests in ASA Grade II, Surgery Grade I and II according to Comorbids

Age (Years)	CXR	ECG	APTT/INR	UCE	FBC	RBS	Urine	PFT's	Pregnancy test	HbA1C
ASA Grade II, surgery grade I, Comorbids: CVS										
16-40	77 (76%)	92 (91%)	41 (41%)	95 (94%)	90 (89%)	45 (45%)	16 (16%)	4 (4%)	13 (13%)	11 (11%)
41-60	87 (86%)	96 (95%)	48 (48%)	89 (88%)	92 (91%)	52 (52%)	28 (28%)	9 (9%)	7 (7%)	20 (20%)
ASA Grade II, surgery grade I, Comorbids: Respiratory										
16-40	95 (95%)	59 (59%)	17 (17%)	74 (74%)	89 (89%)	34 (34%)	14 (14)%	40 (40%)	12 (12%)	2 (2%)
41-60	95 (95%)	82 (82%)	23 (23%)	76 (76%)	88 (88%)	44 (44%)	21 (21%)	46 (46%)	7 (7%)	9 (9%)
ASA Grade II, surgery grade I, Comorbids: Renal										
16-40	46 (46%)	52 (52%)	26 (265)	99 (98%)	92 (92%)	41 (41%)	54 (52%)	1 (1%)	12 (12%)	10 (10%)
41-60	60 (59%)	77 (76%)	29 (29%)	95 (94%)	90 (89%)	52 (52%)	54 (54%)	5 (5%)	7 (7%)	17 (17%)
ASA Grade II, surgery grade I, Comorbids: Diabetes										
16-40	45 (45%)	65 (64%)	24 (24%)	96 (95%)	99 (98%)	81 (80%)	32 (32%)	2 (2%)	12 (12%)	82 (81%)
41-60	62 (61%)	86 (85%)	32 (32%)	93 (92%)	98 (97%)	86 (85%)	42 (42%)	6 (6%)	7 (7%)	79 (78%)
ASA Grade II, surgery grade I, Comorbids: Obesity										
16-40	59 (58%)	58 (57%)	24 (245)	80 (79%)	90 (89%)	63 (62%)	22 (22%)	13 (13%)	16 (16%)	46 (46%)
41-60	71 (71%)	86 (86%)	28 (28%)	82 (82%)	94 (94%)	68 (68%)	28 (28%)	24 (24%)	7 (7%)	46 (46%)
ASA Grade II, surgery grade II, Comorbids: CVS										
16-40	91 (90%)	98 (97%)	57 (56%)	99 (98%)	93 (92%)	55 (555)	23 (23%)	7 (7%)	11 (11%)	22 (22%)
41-60	97 (96%)	101 (100%)	65 (64%)	99 (98%)	94 (93%)	61 (60%)	38 (38%)	10 (10%)	9 (9%)	24 (24%)
ASA Grade II, surgery grade II, Comorbids: Respiratory										
16-40	100 (100%)	76 (76%)	34 (34%)	83 (83%)	92 (92%)	42 (42%)	19 (19%)	54 (54%)	15 (15%)	8 (8%)
41-60	100 (99%)	90 (89%)	38 (38%)	90 (89%)	92 (91%)	51 (51%)	30 (30%)	56 (55%)	9 (9%)	11 (11%)
ASA Grade II, surgery grade II, Comorbids: Renal										
16-40	64 (64%)	62 (62%)	45 (45%)	99 (99%)	92 (92%)	51 (51%)	61 (61%)	7 (7%)	13 (13%)	15 (15%)
41-60	70 (69%)	88 (87%)	44 (44%)	100 (100%)	94 (93%)	64 (63%)	60 (59%)	9 (9%)	8 (8%)	24 (24%)
ASA Grade II, surgery grade II, Comorbids: Diabetes										
16-40	58 (57%)	73 (72%)	39 (39%)	99 (98%)	99 (98%)	89 (88%)	38 (38%)	8 (8%)	12 (12%)	83 (82%)
41-60	71 (71%)	92 (92%)	39 (39%)	100 (100%)	98 (98%)	91 (91%)	48 (48%)	6 (6%)	7 (7%)	81 (81%)
ASA Grade II, surgery grade II, Comorbids: Obesity										
16-40	73 (72%)	66 (65%)	36 (36%)	88 (87%)	96 (95%)	77 (76%)	23 (23%)	23 (23%)	15 (15%)	49 (49%)
41-60	79 (78%)	92 (91%)	41 (41%)	94 (93%)	97 (96%)	78 (77%)	40 (40%)	31 (31%)	10 (10%)	51 (51%)

Biochemical tests and screening should be according to the need that only be applied to preoperative planning of anaesthesia and also for postoperative management. Available guidelines are not understandable for the local population due to the low literacy rate and because of 60% of the population are rural residents. These restrict the use of protocol by general population. Population based guidelines should be adopted that can be accepted nationwide and easily accepted. These guidelines should be made in accordance with the socio-economic status and level of

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education of the patients so that, it can easily comprehensible by all patients.

Pre-operative recommendations for laboratory testing fully implemented in clinical practice could, in particular, increase efficiency without affecting the quality of treatment. The cost savings from optimum pre-operative testing may be important. We need to move away from ordering routine tests, to patient and disease-specific and need-based laboratory tests. Present study suggests that specific recommendation should be developed for our country that could be properly executed.

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