

SIGNIFICANCE AND COST EFFECTIVENESS OF PRE-OPERATIVE ROUTINE LABORATORY INVESTIGATIONS IN YOUNG HEALTHY PATIENTS UNDERGOING ELECTIVE EAR, NOSE & THROAT SURGERY

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Background: Pre-operative preparation is an important component of surgical workup. Adequate clinical assessment to determine fitness for anaesthesia and surgery and to outrule possibilities of existing disease or risk factors against the procedure would suffice in elective surgery on healthy young patients. Still routine investigations are carried out following a protocol, that does not offer added benefit and is not cost effective. **Method:** We evaluated one hundred and fifty young healthy patients planned for elective surgery, to compare adequate clinical assessment with results of routine investigations in such patients, in terms of significance and cost effectiveness. **Results:** Significant co-relation was demonstrated between clinical assessment and routine investigations. Only 03 abnormal results were reported following 600 laboratory investigations on 150 patients. **Conclusion:** Thorough clinical assessment is mandatory for successful outcome of surgery. There is significant co-relation with routine investigations in elective Ear, Nose & Throat (ENT) surgery. Investigations should be restricted to where indicated by clinical assessment. Such policy will significantly reduce the costs and workload, thereby improving quality of health care system.

Key words: Pre-operative preparation; History; Physical examination; Routine investigations; Cost effective

INTRODUCTION

Adequate pre-operative preparation is one of the most important components towards successful outcome of surgical treatment.

The preoperative assessment is an important interaction between the patient and physician. This facilitates the surgeon to assess the medical condition and overall health status of the patient and to determine risk factors if any, against the procedure¹. Elective surgery allows ample time for such preparation.

Pre-operative preparation includes thorough clinical assessment, investigations, patient counseling and anaesthetic plan, besides other arrangements¹.

Understandably, significant costs are involved, that certainly has got an immense impact on the budget utilization of a public tertiary care hospital of a thousand bed capacity, in a country like Pakistan.

So-called routine investigations in elective surgery are ordered following a predetermined protocol/tradition in our setup. These include Haemoglobin (Hb%), Bleeding time (BT), Clotting time (CT) and urine microscopy. These are mainly done for completion sake as the anaesthetist would not extend general anaesthesia in their absence, and hence clinical assessment regarding these parameters is not given due importance, that in turn compromises clinical skills development, especially amongst the trainees. Surprisingly, these investigations are ordered by staff nurse deputed to admit the booked

cases for elective surgery, at the time of admission, mostly.

As a result each and every patient for elective surgery have these investigations done, whether or not indicated based on clinical evaluation. Consequently, there is tremendous amount of workload on the laboratory and personnel. This in turn adversely affects the quality and reliability of results and at the same time, adding enormously to the costs involved. 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.

This prospective study was designed to determine the co-relation between adequate clinical assessment and laboratory investigation results in elective Ear, Nose & Throat surgery, in an attempt to convince that "routine" investigations performed as part of the preoperative preparation of elective surgical patients is unnecessary and expensive.

MATERIAL AND METHOD

This study was conducted at Department of Ear, Nose, Throat and Head & Neck Surgery, Ayub Teaching Hospital, Abbottabad, Pakistan.

One hundred and fifty consecutive young (5 – 40 years), healthy (ASA I) patients, booked for elective surgery were included in this study (Table 1&2)

Table 1- Age groups of patients (n=150)

Age in years	Number of patients	Percentage
05 – 10	22	14.66%
11 – 40	128	85.33%

Table 2- Sex distribution of patients (n=150)

Gender	Number of patients	Percentage
Male	87	58%
Female	63	42%

Various diagnostic and therapeutic procedures were conducted in these patients under general anaesthesia.

Surgical procedure :

- Grommet insertion
- Adenoidectomy
- Tonsillectomy
- Adenotonsillectomy
- Septoplasty
- Examination of ears, under anaesthesia
- Direct laryngoscopy
- Oesophagoscopy
- Preauricular sinus excision
- Lymph node biopsy

Routine investigations, i.e. haemoglobin estimation, bleeding time, clotting time and urine microscopy, were being ordered as usual in these patients and at the same time they were assessed clinically regarding anaemia, bleeding disorders or urinary tract pathology. Clinical assessment outcome was co-related with results of investigations to evaluate the clinical significance and cost effectiveness of routine preoperative laboratory investigations in young healthy patients undergoing elective surgery.

RESULTS

Only three patients (2%) had, on clinical assessment, indications for investigations, whereas, in almost all the patients, i.e. 147 (98%), results of these investigations were reported to be within normal limits, reflecting strong co-relation between clinical evaluation and laboratory investigations (Table 4).

Table 3. Co-relation of clinical & laboratory evaluation

Assessment	Normal	Abnormal
Clinical evaluation	147 (98%)	03 (2%)
Laboratory investigation	147 (98%)	03 (2%)

Out of 150 patients, only one was declared anaemic on clinical grounds compared to two reported having Hb% of less than 12 g/dl.

None of the patients had history or evidence of bleeding tendency clinically and all of them had BT and CT within normal limits.

Two patients had symptoms suggestive of urinary tract pathology but urine microscopy revealed urinary tract infection in only one patient (Table 5)

Table 4- Positi ve yield on clinical assessment (n=150)

Clinical assessment	Number of patients
Anaemia	01 (0.66%)
Bleeding tendency	00
Urinary tract symptoms	02 (1.33%)

Overall, only 03 out of 600 routine laboratory investigations in healthy, young patients for elective ENT surgery, were reported abnormal (Table 6)

Table 5- Positive yield on laboratory investigation (n=600)

Investigation	Number of investigations	Normal result	Abnormal result
Hb %	150	148 (98.66%)	02 (1.33%)
Bleeding time	150	150 (100%)	00
Clotting time	150	150 (100%)	00
Urine microscopy	150	149 (99.33%)	01 (0.66%)
Total	600	597 (99.5%)	03 (0.5%)

Regarding the costs involved, it was calculated to be Rs. 120-00 per patient approximately. On average, 1700 such patients undergo elective surgery in our unit, annually.

DISCUSSION

This study has shown that routine preoperative investigations did not have added benefit over adequate clinical assessment, in elective Ear, Nose & Throat surgery in different age groups.

150 patients were assessed clinically and through laboratory investigations. 600 tests were performed on these patients and only 03 abnormal results were reported.

A detailed history regarding general health , bleeding disorders, symptomatology of different systems would usually hint towards an illness if present. Furthermore, good general physical and systemic examination with special emphasis on the parameters investigated as a part of preoperative assessment, namely anaemia, coagulopathy and urinary tract infection would help in avoiding these investigations and hence save huge expenses that

may be diverted to appropriate areas for improvement in health care system, especially considering financial limitations of developing countries.

Preoperative routine investigations are frequently ordered according to protocol of an institute. Their utility is, however, not based on scientific or medical basis and furthermore, its application in young, otherwise clinically healthy patients, is an expensive and inefficient practice².

Following the protocol, little attention is extended to thorough clinical evaluation. Secondly, it increases the risk of iatrogenic trauma and disease transmission.

These investigations are utilized as a screening tool for undiagnosed pathology that might have implications on the outcome. This seems logical but as a matter of fact it has resulted in excessive expenditure with little added benefit³.

The need for preoperative haemoglobin determination before the administration of general anaesthesia to paediatric patients has long been an issue for debate.

Estimation of haemoglobin is still undertaken routinely before ENT surgery in many centres despite evidence that it is unnecessary, traumatic and expensive.

Regarding preoperative haemoglobin estimation, Hoare TJ did not find any published evidence that operating on children with mild anaemia is unsafe⁴.

It has been proposed that the practice of routine preoperative estimation of haemoglobin is unnecessary, traumatic and expensive, and need reconsideration⁵.

A study by Roy WL has concluded that healthy paediatric patients five years and older scheduled for minor surgery do not require routine haemoglobin determination⁶.

Talking in terms of screening children booked for elective surgery, to detect unknown coagulation defects, a careful history of bleeding risks and investigating only if indicated, is more effective⁷.

Pre-operative guidelines usually do not call for any further examinations, if, in an otherwise healthy patient, neither the case history nor a comprehensive clinical examination reveals any signs of abnormality⁸.

In terms of financial savings that could be utilized in more appropriate areas to improve the health care system, researchers have emphasized more on history and physical examination and that laboratory tests should be selectively used when the patient has appropriate risk factors⁹.

Similarly, from anaesthetist's point of view, a study has concluded that a good history and

physical examination and then reassessment of key portions of the history were the major factors in the development of the anesthetic treatment plan. Laboratory data had little if any effect on the decision-making process¹⁰.

Furthermore, it has been noticed that abnormalities indicated by laboratory tests did not influence preoperative cancellations, intra-operative or postoperative complications, or admissions to the hospital from the ambulatory unit after the surgical procedures. This study concludes that routine preoperative screening laboratory tests have only a limited value in ambulatory surgical patients¹¹.

Other studies have suggested and concluded that routine preoperative investigations in elective surgery in otherwise healthy patients has got limited value. More emphasis has been given to thorough clinical evaluation and investigations being reserved for selective cases if indicated on clinical assessment^{11,12}.

On the other hand, in today's cost-conscious medical environment, routine screening is considered by some to be an unnecessary added expense.

CONCLUSION

Greater emphasis should be placed on history and physical examination. Investigations should be restricted to help in diagnosis and evaluation of the patient in emergency surgery and when the anamnesis, physical examination or a specific kind of surgery recommend it.

Application of such policy will result in substantial financial savings that could be utilized to improve the health care system.

Educational efforts should be directed towards improving resident and staff preoperative test ordering practices.

Selective test ordering will reduce the number and cost of preoperative investigations and improve the quality of results..

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