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A STUDY OF EARLY POST OPERATIVE COMPLICATIONS IN RELATION TO NATURE OF ANESTHESIA AND TYPE OF SURGERY

Anaesthesiology

Dr Bashir Ahmad Mir* MD (Anesthesia) Associate Professor, Department of Anaesthesiology, Saraswati Medical College, Unnao. *Corresponding Author

ABSTRACT

Background: Many people have complications after surgery; some transient, others serious, but all are important to patients. Anaesthesia result in a variety of metabolic and endocrine responses, but conventional wisdom maintains that anaesthetic technique has little long-term effect on patient outcomes. There is accumulating evidence that, on contrary, anaesthetic management may in fact exert a number of longer-term effects in postoperative outcome.

Objectives: To study the incidence of postoperative complications in relation to age, sex and other factors which influence them and to study correlation of post-operative complications with the nature of anaesthesia, duration of operation, type of surgery and in surgery above diaphragm or below diaphragm.

Material and Methods: A prospective study of early post-operative complication in 100 patients', who underwent major surgery, was done in the Department of Anesthesia in a tertiary care teaching hospital, Unnao.

Results: The incidence of post-operative complications was more in patients operated with general anaesthesia (50% and 14% respectively) the morbidity and mortality in patients who were operated under spinal anaesthesia was lower than general anaesthesia, but morbidity was higher in patients who were operated under epidural anaesthesia, but mortality was higher than epidural.

Conclusion: There is accumulating evidence that anaesthetic management may indeed exert a number of influences on longer term postoperative outcomes. Further prospective, randomized, large scale, human trials with long- term follow-up are required to clarify the association between anaesthesia technique and postoperative outcome.

KEYWORDS

Anaesthesia, Emergency surgery, Elective Surgery, Morbidity, Mortality, Post-operative complications, Surgical complications

Introduction:

Anaesthesia can cause many complications, but in general we can think of them as centred on the airway, respiratory or circulatory systems. For some there is debate about where 'anaesthesia' complications end and 'surgical' complications start. For example, postoperative pneumonia may be caused by the abnormal ventilation that occurs under anaesthesia as well as the positioning for surgery and the surgical incision that makes breathing and coughing painful, shallow and ineffective. Modern anaesthetic practice is aimed at being safe and avoiding complications.[1,2]

Anesthesia is commonly classified into two main techniques: general anesthesia in which drugs achieve central neurologic depression, and regional anesthesia, in which drugs are administered directly to the spinal cord or nerves to locally block afferent and efferent nerve input.[3,4] After surgery, the risk of fatal or life threatening events like deep vein thrombosis, pulmonary embolism, myocardial infarction, transfusion requirements, pneumonia and renal failure are increased several fold, but there is debate about whether the type of anesthesia has any substantive effect on these risks. Neuraxial blockade has several physiological effects that provide a rationale for expecting to improve outcome with this technique.[5] It is logical to hypothesize that a "stress-free" perioperative period may attenuate or prevent detrimental physiologic responses and decrease resultant morbidity.[2] Progress is rapid, and dissemination of such information is unprecedented.

Never before has our means of communications within the medical profession been better. Ideally, no-one would have a complication after surgery. Some complications may be avoidable whilst others inevitable in some circumstances. In some circumstances patients may choose not to proceed with their surgery once they at all stages of the patients perioperative 'journey' there are techniques and strategies that health care professionals can use to help stop postoperative complications. Some of these are generally accepted (eg timely antibiotics) whilst others are gaining increasing prominence such as the concept of a 'perioperative physician'.[1,2]

For the purpose of description, the post-operative complications are divided into early and late. Early complications, if neglected may be hazardous and increase hospitalization time and mortality in a given series of operations. But if known and managed accordingly, will decrease the mortality and morbidity in post-operative phase.

Aim and Objectives:

To study the incidence of postoperative complications in relation to age, sex and other factors which influence them and to study correlation of post-operative complications with the nature of anaesthesia, duration of operation, type of surgery and in surgery above diaphragm or below diaphragm.

Material and Methods:

It was a prospective study of early post-operative complication in 100 patients', who underwent major surgery, was done in the Department of Anesthesia in a tertiary care teaching hospital, Unnao. Patients who underwent major surgery during the period of year 2017-2018 were taken for the study in the present series. Major surgery was considered when operation was done under anaesthesia, where duration of Surgery was prolonged, and risk of complications were more or where the vital organ was operated upon.

But not one of the above criteria makes an operation major but taking into consideration of all above and other factors the surgery was defined as major. Each case was studied under following heads from the available case records like demographic data, presenting complaints, past illness, personal history, general, local and systemic examination findings.

Study of investigations was done for the confirmation of diagnosis and screening of patients for associated diseases. A detailed study of operation notes for the type of operation, duration of operation, type of anaesthesia, elective or emergency surgery and any complications during operation or during recovery from anaesthesia were noted. Appearance of complications was recorded in chronological order. The study was done correlating the various factors which influenced the mortality and morbidity in postoperative phase.

Results:

In the present study 100 cases who underwent major surgery were included out of which 70 patients underwent elective surgery and 30 patients were operated in emergency. Out of them 80 were males and 20 were females. Out of 100 cases surgery below diaphragm was performed in 90 patients and above diaphragm was operated in 10 patients. Out of 100 patient's complications occurred in 35 patients (35%) and the mortality were 10% of all operations.

Table 1: Sex wise distribution of complications

Sex	No of Surgery	%	No of complications	%	Mortality	%
Male	80	80	25	31.25	08	10
Female	20	20	10	50	02	10
Total	100	100	35	35	10	10

Table 1 shows that incidence of post-operative complications is much higher in females 50% but the incidence of mortality is equal 10%.

Table 2 shows that the incidence of post-operative complications is predominantly higher in patients below the age of 10 years (60%) and patients above 51 years of age (57%); similarly, mortality was high in patients under 10 years and above 51 years of age as compared to other age groups of patients.

Table 3 represents that incidence of post-operative complications is much higher in below diaphragm (35%) then in patients who underwent surgery above diaphragm (30%), from the same table it is also evident that the incidence of mortality is comparable in above diaphragm surgery (10%) and patients below diaphragm surgery (10%).

Table 2: Age wise distribution of complications

Age (years)	No of Surgery	%	No of complications	%	Mortality	%
0-10	05	05	03	60	02	40
11-20	12	12	03	25	00	00
21-30	20	20	04	20	01	05
31-40	17	17	05	29	01	06
41-50	22	22	07	32	03	13.6
51-60	14	14	08	57	01	07
61-70	05	05	03	60	02	40
>70	05	05	02	40	00	00
Total	100	100	35	35	10	10

Table 3: Type of surgery above and below diaphragm

Type of surgery	No of Surgery	%	No of complications	%	Mortality	%
Above diaphragm	10	10	03	30	01	10
Below diaphragm	90	90	32	35.5	09	10
Total	100	100	35	35	10	10

Table 4 represents that the incidence of post-operative complications and mortality was more in patients operated with general anaesthesia (50% and 14% respectively) the morbidity and mortality in patients who were operated under spinal anaesthesia was lower than general anaesthesia, but morbidity was higher in patients who were operated under epidural anaesthesia, but mortality was higher than epidural.

Table 4: Complications in relation to type of anesthesia

Anesthesia	No of Surgery	%	No of complications	%	Mortality	%
General	50	50	25	50	07	14
Spinal	35	35	07	20	02	5.7
Epidural	15	15	03	20	01	6.6
Total	100	100	35	35	10	10

Table 5: Distribution of various complications in emergency/ elective surgery

Type of complication	Number	Percentage (%)
Cardiovascular complications		
Arrhythmias	01	01
Peripheral circulatory failure, Other than haemorrhagic shock	08	08
Haemorrhagic shock	02	02
Cardiac arrest	01	01
Total	12	12
Urinary complications		
Retention of urine	07	07
UTI	08	08
Uremia	01	01
Acute renal failure	01	01
Total	17	17
Wound complications		
Infection	15	15
Minor gaping	04	04
Burst abdomen	01	01
Total	20	20
Respiratory complications		
Pneumonia	06	06
Pleural effusion	02	02
Respiratory arrest	01	01
Pneumothorax	01	01
Total	10	10
Gastrointestinal complications		
Vomiting	06	06
Diarrhoea	03	03
Peritonitis	02	02
Anastomotic leak	01	01
Total	12	12
Miscellaneous complications		
Toxemia and septicemia	06	06
Hyperpyrexia	02	02
Bed sores	01	01
Total	09	09

Study showed the patients who are associated with predisposing systemic disease in them the incidence of post-operative complications and mortality is higher.

The present study also revealed that post-operative complications are more in patient having systemic disease 72.72% as compare to patients who have no systemic disease 35.59% as well as it is evident that mortality is more in group of patients having systemic disease 27.27% and less in normal group of patients 7.8%.

Discussion:

Complications in surgery are always of concern to surgeon. There have been various studies on the different aspects of post-operative complications like correlation of predisposing factors, risk groups of patients, relation to type of surgery and so on. In the present study had 100 cases of major surgery for the incidence of early post-operative complications and their relation to various factors which influence the morbidity and mortality.

Out of 100 patients subjected to major surgery 70 (70%) underwent elective surgery and 30 (30%) had emergency surgery. HDU: High Dependency unit; PACU: Post Anaesthetic Care Unit.[1,6]

Haemorrhage can be classified as:

- 'Primary': occurring when a vessel is cut during surgery.
- 'Reactionary': occurring when rises in blood pressure at the end of the operation cause vessels that had previously not been bleeding to start to do so.
- 'Secondary': normally due to infection which causes damage to a vessel day after surgery. The increased risk of haemorrhage may be multi-factorial in origin.[1,6]

Post-operative infections can be classified by both site and cause.

Surgical site infection (SSI)

SSIs can complicate recovery in 5% of patients; risk factors include intra-operative exposure to endogenous organisms (e.g. during bowel surgery), prolonged surgery and impaired immunity (e.g. diabetes, immunosuppresion) (NICE, 2008). Management may require antibiotics, suture removal and debridement with open wound care (NICE, 2008).[6,7]

Central venous catheter infection

Infection of central venous catheters (CVC) may lead to catheter related blood stream infections (CRBSI) that can have a 25% mortality.

CVCs should be reviewed daily and CRBSI should be suspected when there is a CVC and signs of bacteraemia; a positive blood culture and growth of the same organism from the CVC would support the diagnosis. CVC's should always be removed as soon as they are not needed. Inflammation around the CVC insertion is relatively uncommon, and its absence does not rule out CRBSI.[6]

Urinary tract infection

Urinary catheters are inserted perioperatively to facilitate surgery or to aid fluid balance management. They do, however, predispose patients

to urinary tract infections that may need antibiotic treatment.

Abdominal collections

Abdominal collections are more likely if there is leak of bowel contents. They may present with nausea, malaise, pain, swinging fever, localised peritonitis or tenderness and altered bowl function and the onset of symptoms is determined by abscess location: pelvic abscesses tend to occur 4-10 days after surgery whilst subphrenic abscesses occur 7-21 days after surgery.[6]

Limitations of study

As it was a single centre study the results cannot be genralized to entire population. Furthermore comprehensive and multicentric studies including meta analysis of various earler studies should be done, to have a more meaningful and high impact results.

Conclusion:

Postoperative complications are always a concern to surgeon. Early postoperative complications after major surgery occurred in significant number and must be anticipated in time and proper measures instituted to control them. Incidence of early post-operative complications was significantly higher in emergency surgery than in elective surgery. Major risk factor was unhealthy preoperative status especially dehydration, anaemia, malnutrition, electrolyte imbalance and infection, which significantly increase the morbidity and mortality of postoperative complications. Morbidity and mortality was more in very young patients due to low birth weight, emergency surgery, technical error and the fact that children were more prone to complications of anaesthesia and in patients over 50 years age. Morbidity and mortality of postoperative complications increase with age.

Post-operative complications are an important cause of morbidity, mortality, extended hospital stay and increased costs. Complications can be general or specific to particular operations. There are many strategies to prevent postoperative complications. Assessment of surgical complications should include a focussed history with particular attention to risk factors.

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