Dissertation on

"A STUDY OF THE OUTCOME OF POST OPERATIVE PATIENTS ON VENTILATORS"

Dissertation Submitted to
THE TAMILNADU DR. M.G.R. MEDICAL UNIVERSITY,
CHENNAI.

With Partial Fulfillment of the Regulations
for the Degree of
MASTER OF SURGERY

BRANCH-1 (GENERAL SURGERY) AT

MADRAS MEDICAL COLLEGE, CHENNAI.

MADRAS MEDICAL COLLEGE, CHENNAI.

APRIL 2017

CERTIFICATE

This is to certify that the dissertation titled "**A STUDY OF THE OUTCOME OF POST OPERATIVE PATIENTS ON VENTILATORS"** is the bonafide work done by **Dr. S.SUGUMAR**, during his M.S. General Surgery course 2014-17, under my guidance and supervision in partial fulfillment of the rules and regulations laid down by The Tamil Nadu Dr. M.G.R. Medical University, Chennai for M.S. (Branch-I) general surgery Examination, April 2017.

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DECLARATION

I, **Dr. S. SUGUMAR,** certainly declare that this dissertation titled "**A STUDY OF THE OUTCOME OF POST OPERATIVE PATIENTS ON VENTILATORS"** represents a genuine work of mine. The contributions of any supervisors to the research are consistent with normal supervisory practice and are acknowledged. I also affirm that this bonafide work or part of this work was not submitted by me or any others for any award, degree or diploma to any other university board, either in India or abroad. This is submitted to the Tamil Nadu Dr. M.G.R. Medical University, Chennai in partial fulfillment of the rules and regulations for the award of Master of Surgery degree Branch 1 (General Surgery).

Dr. S.SUGUMAR

Date:

Place:

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To
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Dear Dr.S.Sugumar,

The Institutional Ethics Committee has considered your request and approved your study titled **"A STUDY OF THE OUTCOME OF POST-OPERATIVE PATIENTS ON VENTILATORS " - NO.14022016.**

The following members of Ethics Committee were present in the meeting hold on **02.02.2016** conducted at Madras Medical College, Chennai 3

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12.Tmt.Arnold Saulina, MA.,MSW.,	:Social Scientist

We approve the proposal to be conducted in its presented form.

The Institutional Ethics Committee expects to be informed about the progress of the study and SAE occurring in the course of the study, any changes in the protocol and patients information/informed consent and asks to be provided a copy of the final report.

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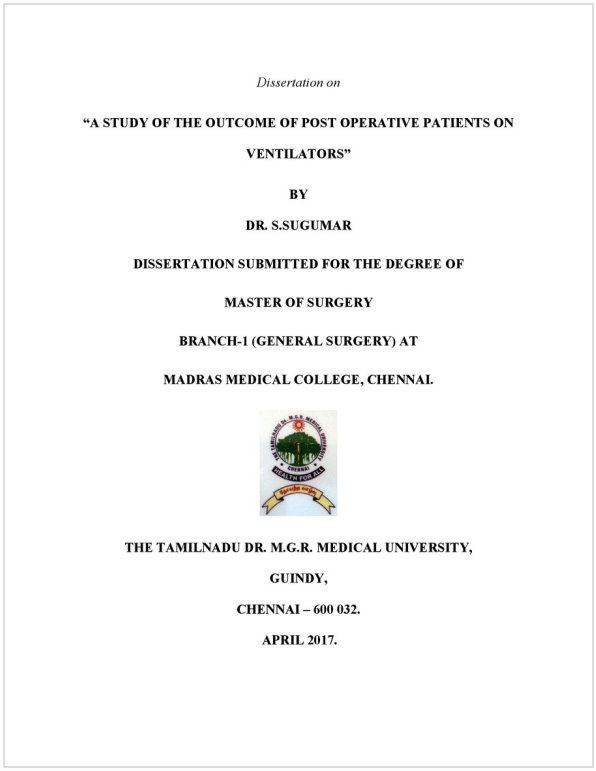

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INTRODUCTION

Management of mechanical ventilated post-surgical patients in Intensive Surgical Care Unit needs an interdepartmental disciplinary approach by surgeon, anesthetist and paramedical team. Various factors like respiratory, surgical and other hemodynamic factors play an important role in the outcome of mechanically ventilated patients (ISCU).

There are various complications of mechanical ventilation. Post-operative wound infection, sepsis and post-operative respiratory complications are the most common complications in the peri and post-operative period. Post-operative respiratory complications is the second commonest cause for patients mortality, wound sepsis being the primary cause. Respiratory failure after general anesthesia and tracheal intubation has been shown to be one of the most meaningful factors associated with poor patient outcomes leading to longer hospital stay, increased expenses and increased thirty day mortality.

Presently the need of the study is to reduce the use of ventilator in the post-operative period and timely assessment and management of mechanical ventilated patients and to identify the effects of surgical factors in determining the outcome of mechanical ventilated patients, which will in turn help in the planning of proper management.

In this study, we assess outcome of post-operative patients on ventilators.

This study was conducted at the Institute of General Surgery, Madras Medical College and Rajiv Gandhi Government General Hospital

AIMS AND OBJECTIVES

- To assess the patient factors leading to mechanical ventilation in emergency and elective procedures.
- To study about the modes of mechanical ventilation needed
- To assess the incidence of complication and mortality of patients on mechanical ventilation.

REVIEW OF LITERATURE

Risk assessment is a fundamental concept of contemporary surgical practice. It is important for the following reasons. Appropriate selection of surgical patients depends upon the balance between the outcome likely to be obtained from the surgery and the risk posed by the planned surgical procedure. Assessment of risk will guide the surgeon and anesthetist as to the degree of supportive care that will be required in the postoperative period risk assessment will also identify factors amenable to optimization in the immediate preoperative period, number of risk-scoring systems have been developed. Scoring systems combines patient demographic, comorbidity and physiological parameters along with operative factors to quantify risk. There are many different disease-specific risk assessment scores, smaller number of generic scoring system.

Risk factors

Risk factors related to age, comorbid illness, the nature of the surgery, the surgeon and the patient's medication.

Age:

Comorbidity like cardiovascular disease, respiratory disease and smoking.

Gastrointestinal causes like malnutrition, adhesions, jaundice.

Renal disease, haematological problems, obesity, diabetes mellitus, drugs.

SURGICAL FACTORS

Surgeon, operative severity and mode of admission (i.e. emergency surgery), gender, social deprivation.

AGE

Risk of death and serious complications is high in older patients following major surgery[1]. No patient should be denied an operation on the basis of age. An understanding of how the risks and benefits of surgical intervention change with advancing age is important for arriving a informed decision. In the elderly population restricted mobility and frequent presence of intercurrent disease, decreased reserve of cardiac, respiratory or renal function may potentially restrict recovery. Inferior outcome following surgery in older patients when compared with young patients has been proved in many specialities. Wound infection rates tend to be higher in older people. Postoperative stroke occurs in 1% of patients above the age 65 years and in 3% of those above 80 years. The autoregulation of the cerebral circulation becomes impaired with age, extremes of hypotension and hypertension must be avoided throughout the perioperative period[2]. Elderly patients undergoing major planned surgery for colorectal cancer are more likely to die following surgery than younger patients with a similar comorbidity burden. Risk of mortality in

the months that follow surgery is significantly higher than that of age-matched population controls. Mortality risks are even higher when patients present as emergencies. Patients aged older than 80 years who undergo emergency surgery for large bowel obstruction have a 30 day mortality rate that exceeds 20%[3]. A multidisciplinary approach, involving surgeons, anaesthetists, elderly care physicians and physiotherapists, is being adopted to optimize perioperative care and rehabilitation in this potentially vulnerable age groups. Interventions like intravenous fluid administration and blood transfusion has potential risks of circulatory overload in patients with limited cardiac reserve. Elderly people require smaller doses of narcotic analgesics and sedative because these may precipitate confusion, due to direct action on the central nervous system and from resulting hypoxia as a consequence of respiratory depression.

Comorbidity:

Cardiovascular disease including myocardial infarction and congestive heart failure are the most common causes of perioperative death in patients undergoing non-cardiac surgery. Lee and colleagues studied over 4000 patients[4] at a tertiary centre undergoing elective non-cardiac surgery. They identified that major cardiac complications occurred in 2% of patients. Factors identified as independent predictors of cardiac complications are high-risk surgery, past history of ischaemic heart

disease, congestive cardiac failure, prior history of cerebrovascular disease, preoperative insulin treatment and an elevated creatinine. These factors collectively represent the Revised Cardiac Index. The Committee of Perioperative Cardiovascular Evaluation for Non-cardiac Surgery American College of Cardiology (ACC)[5] and American Heart Association (AHA) Task Force] has provided a framework for considering the management of patients with cardiac risk undergoing non-cardiac surgery. The guidelines identify three broad categories, including major, intermediate and minor clinical predictors of increased perioperative cardiovascular risks such as myocardial infarction, congestive cardiac failure and death. When present, major predictors necessitate intensive management and delay or cancellation unless the condition requires emergency surgery to save life. Intermediate predictors enhance the risk of perioperative cardiac complications and require careful assessment by objective testing of the patient's cardiac performance. It should be noted that a history of myocardial infarction (occurring more than 30 days previously) or pathological Q waves on the ECG are considered as intermediate risk factors, compared with a recent myocardial infarction, which is listed as a major predictor. Minor predictors are recognized markers for cardiovascular disease that have not been proven independently to increase perioperative risk. Major factors include

Unstable coronary syndromes:

Recent myocardial infarction with evidence of important ischaemic risk by clinical symptoms or non-invasive study[6]

Unstable or severe angina (Canadian class III/IV)

Decompensated congestive heart failure

Significant arrhythmias–High-grade atrioventricular block, Symptomatic ventricular arrhythmias in the presence of underlying heart disease, Supraventricular arrhythmias with uncontrolled ventricular rate.

Severe valvular disease.

Intermediate: Mild angina pectoris (Canadian class 1 or 2)

Prior myocardial infarction by history or pathological Q waves

Compensated heart failure

Congestive heart failure

Diabetes mellitus.

Minor: Advanced age

Abnormal ECG (left ventricular hypertrophy, left bundle branch block, ST–T abnormalities)

Rhythm other than sinus (e.g. atrial fibrillation)

Low functional capacity (inability to climb one flight of stairs) and History of stroke

Uncontrolled systemic hypertension

Major predictors present: surgery cancelled unless the condition is immediately life threatening. Intensive cardiological management takes priority. Some may require myocardial revascularization (when the stress of elective non-cardiac surgery is likely to exceed the stress of daily life) in the first instance.[7]

Intermediate predictors present: objective performance of cardiac status (e.g. echocardiography, stress ECG) undertaken, on which is based the individual risk that should influence the decision to proceed with surgery. Minor predictors present: surgery can proceed with adequate monitoring and postoperative support[8].

Respiratory disease and smoking:

The incidence of respiratory disease in surgical patients varies with the population. Postoperative pulmonary complications are more in the presence of either obstructive or restrictive pulmonary disease and carries an adverse effect on the cardiovascular system. Hypoxaemia, acidosis,

hypercapnia, and the increased work of breathing can cause further deterioration in patients with compromised cardiac function. Chronic obstructive airways disease has more incidence of postoperative pulmonary complications than restrictive airway disease. Preoperative assessment of functional capacity like spirometry and blood gas analysis should be done in these patients. Surgery in patients with acute respiratory infections should be postponed until 2 weeks after the resolution of the infection in possible situations. Intensive physiotherapy, bronchodilators and antibiotics should be given preoperatively.[9] Postoperative chest infections and segmental or lobar collapse are common in patients with chronic bronchitis and in heavy smokers. Smoking increases the risk of surgery and anaesthesia as a result of its adverse effects on the cardiovascular and respiratory systems. Nicotine and carbonmonoxide are responsible for the immediate cardiovascular problems, by the formation of carboxyhaemoglobin, carbonmonoxide alters the oxygen dissociation curve such that the affinity of haemoglobin for oxygen is enhanced and It also has a weak negative inotropic action on the heart. Nicotine causes an increase in heart rate and blood pressure and enhances the demand of the myocardium for oxygen. Elimination of both carbon monoxide and nicotine with improvement in the cardiovascular fitness is complete following a 12–24 hour abstention from smoking. There is a sixfold increase in the postoperative respiratory

morbidity among smokers. The responsible factors include small airways disease, hypersecretion of a thick viscid mucus and impairment of tracheobronchial clearance. Smoking also depresses the immune system. It induces reduction in immunoglobulin levels, natural killer cell activity, neutrophil chemotaxis and pulmonary alveolar macrophage activity. It is therefore recommended that smokers should stop smoking 3 months prior to surgery in case of uncomplicated surgery. At least 12 to 24 hrs abstinence is necessary in unavoidable situation.[10]

Malnutrition

The malnourished patient is at increased risk of postoperative morbidity. Assessment of nutritional status is difficult In these patients .if history suggestive of loss of 15–20% of body weight is associated with impairment of physiological function and postoperative complications will be high. body stores of fat and protein estimation should be done. Muscle wasting can be detected by examing the following muscles temporalis, interosseous and spinatus muscle. Presence of oedema is suggestive of protein malnutrition. The level of plasma albumin is not a particularly good index of malnutrition. Albumin is a negative acute phase reactant, in a metabolically stressed patient due to sepsis, a low serum albumin will be present. Malnourished patient with low plasma albumin, focus of sepsis will be present. period of supplemental nutrition

prior to surgery Is attempted in malnourished patients. General guideline is if body weight loss of 15–20% below the patient's ideal weight, with clinical evidence of muscle wasting and weakness, nutritional repletion before surgery should be implemented. Enteral feeding is preferred for preserving gut immunological function. Patients with severe gastrointestinal malfunction may need parenteral nutrition.

Adhesions:

Adhesions are the important risk factor in the outcome of surgery.the patient who has undergone a laparotomy there is a high chances of intra-abdominal adhesion. Reoperation is lengthier and chances of blood loss will be high.Due to dense adhesions carefully dissection should be done to avoid bowel injury and post operative enterocutaneous fistula.[11]

Jaundice:

The jaundiced patient has greater risk of post surgical complications like septicemia, clotting disorder, hepatic failure, renal failure and fluid and electrolyte imbalance. Drug metabolism, conjugation process and anaesthetic drug metabolism is reduced due to liver cell failure. Wound healing will be delayed in jaundiced patients. Parenteral nutrition should be given to jaundiced patients due to nutritional deficit. Oral intake of high carbohydrate and minimal intake of aromatic aminoacids should be encouraged .Diseased and obstructed biliary tree and the bile in these

patients may be infected by aerobic Gram-negative organisms which will cause postoperative infective complications. Deficiency of vitamin K-dependent factors causes prolonged prothrombin time due to malabsorption of this vitamin. In these cases intramuscular vitamin K injection for 1 to 3 days will bring back the normal prothrombin time. Severe cases will require fresh frozen plasma transfusion.[12]

Renal

Renal assessment to be done prior to surgery. Renal failure requires hemodialysis in the perioperative period and Acid base balance and potassium levels have impact on cardiac activity and cardiac dysrhythmias will occur in acidosis and hypo and hyperkalemia. Renal failure is usually associated with cardiac impairment. In emergency situations pre renal failure should be corrected.

Haematological conditions

Anaemia

Anaemia and anaemia with added renal and cardiac illness multiplies mortality risk in patients undergoing major surgery .In anaemia reduced oxygen carrying capacity causes strain on the cardiovascular system,[13] chest infection and confusion it can be avoided by preoperative correction of anaemia. Patients with iron-deficient anaemia, should ideally be

corrected by oral iron therapy if asymptomatic. Intravenous iron therapy, cell salvage, erythropoietin, acute normovolaemic haemodilution and autologous blood transfusion are the options available for asymptomatic or mildly symptomatic patients. Allogenic blood transfusion in patients with a haemoglobin level less than 8g/dL, with a lowered threshold is considered when cardiac comorbidity coexists. Elective patients transfused with blood 1 to2 weeks prior to surgery for haemodynamic stabilization. Most patients have adjusted to the reduced haemoglobin load and the haemodilution is beneficial in ensuring adequate tissue perfusion during surgery, controlled haemodilution down to a packed cell volume of 30–35% has been reported to reduce morbidity. Hypercoagulable states like sickle cell disease, polycythemia, thrombocytosis should be screened before surgery, adequate hydration and oxygenation maintained during the perioperative period.

Diabetes mellitus

Diabetes mellitus is associated with increased need for surgery and enhanced perioperative risk.[14] Diabetic mellitus patients need special management. Adequete hydration and blood glucose level maintainence is importance feature in diabetic patients during perioperative period. Predisposition to CAD in diabetic patients causes myocardial infarction during perioperative period which will be silent.

Obesity

Obese patients have high risk of pulmonary complications, wound infection, wound dehiscence and deep vein thrombosis. They also have a higher incidence of intercurrent disease and restricted mobility.[15] The operative procedure is technically difficult, minimally invasive procedure will failure and iatrogenic injury can occur during surgery. Controlled weight reduction is recommended before elective surgery. Obese patients have sleep apnoea, can cause postoperative pulmonary failure. These patients may require post operative respiratory support.

Drugs

Many of the patients coming to surgery are on pre medication. Antihypertensives should be continued up to the time of operation. Oral contraceptives has risk of postoperative deep vein thrombosis. The additive affect of the contraceptive and general anaesthesia will cause reduced activity of antithrombin lll. Progesterone only pill does not have that risk hence continued over the time of surgery. Oestrogen-containing contraceptives and hormone replacement therapy should be discontinued 4 weeks before elective surgery, in emergencies prophylactic low-dose heparin and compression stockings should be used and early mobilization advised. Patients taking warfarin are at risk of haemorrhagic complications. Warfarin should be discontinued at least 3–7 days before

surgery if there is low risk of venous thromboembolism. If international normalized ratio is <1.5. Surgery can be conducted. If anticoagulation is necessary low molecular weight heparin or in fractionated heparin is used 4 hours before surgery and restarted 12 hours post surgery in exchange of warfarin. In some emergencies reversal of warfarin is necessary in that situations with the hematologist opinion, vitamin k, prothrombin complex concentrate and fresh frozen plasma administered. Patients with bare metal stents requiring surgery within 6 months and drug eluting stent placed patients within 12 months, aspirin and clopidogrel can be continued during perioperative period.[16]

Operative severity and operating surgeon

The magnitude of an operation, elective or emergency procedure is itself risk factor for the outcome of surgery, in elective versus emergency operations mortality risk and cardiac complications are two to five times more in emergency surgical procedures than elective operations. Emergency is associated with substantial physiological and biochemical derangement. Hence emergency surgery is itself an important risk factor.[17] It is also important and should be agreed, the individual surgeon is a significant risk factor. The outcome of similar operations can vary grossly according to the skill of the operating surgical teams and it is

important for all surgeons to be aware of their own results and must ensure reasonable standard.

Preoperative assessment

Preoperative assessment is an important aspect of surgical treatment. Surgical outcome will be highly dependent on preoperative assessment and corrective measures taken during preoperative period. Operative risk assessment, patient selection, fitness for general anaesthesia assessment and tolerance of indicated surgery, complete explanation to the patient about the nature of the surgical procedure, so that fully informed consent can be obtained. Nutritional, fluid and electrolyte deficiencies, blood volume optimization. Prophylactic measures against common postoperative complications, calculation of blood requirement during perioperative period, assessment of postoperative duration and other supports required during postoperative period. patient selection involves balancing the relative benefits from planned surgical procedure against the known risks and complications.[19] Decision is arrived with the background history of the natural history of the untreated illness from which the patient is suffering as well as the life expectancy and quality of life gains achievable through operative or nonoperative procedures, under certain circumstances a consensual decision is obvious to both patient and surgeon. Many times the most appropriate plan of action is less clear,

there will be enough time to plan in case of elective procedure. Shared decision-making models is preferred currently. Certain procedure has high mortality in emergency setting than optimization and Electively treated. Surgery volume and experience in subspecialty also plays role in outcome of surgery.

Perioperative nutrition

In recent years perioperative Enhanced Recovery of patients After Surgery (ERAS) has been incorporated into mainstream clinical practice, main aspect of multimodal rehabilitation protocols is Nutritional aspects of care. The severely malnourished patient -weight loss of ≥10–15% body weight, albumin <30 g/dL, BMI <18.5, should be given nutritional care for at least 10–14 days, even if it causes delay in surgery. patients who are anticipated to not be able to feed for 1 week not malnourished but should be considered for nutritional support.[18] The key principles of perioperative nutrition management is, catabolic response to surgery should be minimized, long periods of starvation should be avoided with reinstitution of feeding as early as possible after surgery. Patients permitted to drink clear fluids 2 hours before surgery and solids upto 6 hours preoperatively, carbohydrate loading drinks can be offered in the hours preceding the surgery. Patients should be allowed to take normal food intake or enteral feeding as early as possible. The majority of

patients can be fed early by mouth even after major gastrointestinal surgeries. Patients undergoing head and neck surgery and severe trauma patients, patients who are malnourished at the time of surgery will require enteral tube or parenteral nutrition.[20] The enteral route is preferred. Standard protein regime enteral feeds are encouraged. Perioperative supplementation with immune modulating substrates such as nucleotides,arginine, and ω-3 fatty acids is beneficial in certain situations.

World Health Organization surgical safety checklist

It is a worldwide initiative to decrease the number of surgical errors and complications. This has been endorsed by the Department of Health, National Patient Safety Agency and all the Royal Colleges and after an initial trial has now been implemented nationwide. The WHO's 10 essential objectives include

1.The team will operate on the correct patient at the correct site

2.The team will use methods known to prevent harm from anaesthesia, while protecting the patient from pain.

3.The team will recognize and effectively prepare for lifethreatening loss of airway or respiratory function.

4.The team will recognize and effectively prepare for risk of high blood loss.

5. The team will avoid inducing any allergic or adverse drug reaction known to be of significant risk.

6.The team will consistently use methods known to minimize risk of surgical site infection.

7.The team will prevent inadvertent retention of instruments or swabs in surgical wounds.

8. The team will secure and accurately identify all surgical specimens.
9.The team will effectively communicate and exchange critical patient information for the safe conduct of the operation.

10Hospitals and public health systems will establish routine surveillance of surgical capacity, volume and results.

MECHANICAL VENTILATION

Ventilation is defined as movement of gas in and out of the lungs.

Positive pressure (artificial) vs Negative pressure(physiological ventilation)

Normal mechanism of respiration is effected by contraction of respiratory muscles i,e. diaphragm and intercostals creating a negative sub atmospheric intrapleural and intra alveolar pressure.[21] A pressure gradient is thereby created between the upper airway and alveoli, air flows into the lungs. The lung tissue recoils passively during expiration increasing the

intraalveolar pressure there by reversal of gradient occurs causing air flowing out of the lungs. Mechanical ventilation can be effected by applying positive pressure above the atmospheric pressure to the upper airway secondly by applying a sub atmospheric pressure around the chest wall called as negative pressure ventilation known as IRON LUNG AND CUIRASSE VENTILATION. Hence positive pressure ventilation gas flows is delivered to the lungs under a positive pressure gradient which is not physiological.

Effects of positive pressure ventilation:

1. Decrease in cardiac output and O2 delivery: increase in intrathoracic pressure is transmitted to mediastinum, great vessels which returns blood to the heart resulting in compression of pulmonary blood vessels causing overall decrease in stroke volume, cardiac output and oxygen delivery.

2. Changes in blood pressure: blood pressure in aorta, left atrium, pulmonary artery and right atrium during positive pressure ventilation is higher than in spontaneous ventilation. in cardiopulmonary compromised patients changes in blood pressure will further exaggerate the disease process[22].

3. Decrease in renal circulation : positive pressure ventilation causes decrease in blood flow to the kidney results in reduced perfusion of the

glomeruli. urine output is decreased, continuation of hypoperfusion results in renal failure.

4. Changes in hepatic circulation: positive pressure ventilation has no significant effect on hepatic function. When PEEP is added, liver blood flow reduced.hepatic and renal dysfunction leads to changes in drug clearance. PEEP in presence of incresed intra abdominal pressure greater than 20mm Hg has significant effect on cardiac output.

5. Neurological changes in hyperventilation.

a)Reduction in intracranial pressure.

b)Decrease in cerebral blood flow.

c)Shift to the left (oxyhemoglobin curve)

d)oxygen hemoglobin affinity increases.

e)oxygen release to tissue is reduced.

f)Cerebral hypoxia

INDICATIONS OF MECHANICAL VENTILATION:

1.Bradypnea or apnea with respiratory arrest.

2.Acute lung injury.

3.Tachypnea >30 breaths per minute.

4.Vital capacity less than 15 ml/kg.

5.minute ventilation >10 l/min.

6.Pao2 <55mmHg.

7.A-a po2 >450 mmHg.

8.Respiratory muscle fatigue.

9.Obtundation or coma.

10.hypotension.

11.Paco2> 50 mmHg.

12.pH<7.25

13.Neuromuscular diseases

14.Clinical deterioation.

There are four types of Respiratory failure.

TYPE 1 RESPIRATORY FAILURE or HYPOXEMIC RESPIRATORY FAILURE.

TYPE 2 RESPIRATORY FAILURE or VENTILATORY FAILURE or HYPERCAPNIC RESPIRATORY FAILURE

TYPE 3 RESPIRATORY FAILURE or PERIOPERTATIVE

TYPE 4 RESPIRATORY FAILURE -shock with hypoperfusion of respiratory muscles[23].

Perioperative and Post operative patients will be under

TYPE 2 RESPIRATORY FAILURE-high arterial Pco2 level due to muscle weakness (Fatigue, electrolyte imbalance,myopathy)

TYPE 3 RESPIRATORY FAILURE(PERIOPERATIVE)- due to reduction of FRC below alveolar closing volumes caused by supine position, general anaesthesia, splinting(incisional pain),obesity,ascites,diminished cough.

TYPE4 RESPIRATORY FAILURE- during Normal resting state 1-5% of the cardiac output to lungs and respiratory muscles increase upto tenfold. Mechanical ventilation allows resting of the respiratory muscles.[24]

MODES OF MECHANICAL VENTILATION -The mode of mechanical ventilation refers to the method of inspiratory support.

VOLUME LIMITED VENTILATION-inspiration ends after delivery of the set tidal volume.

PRESSURE LIMITED VENTILATION-inspiration ends after delivery of the set inspiratory pressure.

volume limited ventilation are of several types

1.controlled mechanical ventilation(CMV)

2.assist control ventilation (AC)

3.intermittant mandatory ventilation(IMV).

4.Synchronized intermittent mandatory ventilation.(SIMV)

CONTROLLED MINUTE VENTILATION - The minute ventilation is determined entirely by the set respiratory rate and tidal volume. CMV does not require any patient work.

ASSIST CONTROL VENTILATION- the clinician determines the minimal minute ventilation by setting the respiratory rate and tidal volume.the patient can increase the minute ventilation by triggering additional breaths. Each patient initiated breath receives the set tidal volume from the ventilator.[25]

INTERMITTANT MANDATORY VENTILATION- IMV is similar to AC in two ways, the clinician determines the minimal minute ventilation and the patient is able to increase the minute ventilation. However IMV differs from AC in the way that the minute ventilation is increased.

SYNCHRONISED INTERMITTANT MANDATORY VENTILATION- SIMV is a variation of IMV, in which the ventilator breaths are synchronised with the patient inspiratory effort. SIMV can be used to titrate the level of ventilatory support over a widerange. this is the

advantage of the mode. cardiac output, mean blood pressure, capillary wedge pressure and oxygen consumption were all better when SIMV support level is less than 50%.SIMV and AC are the most frequently used forms of volume limited mechanical ventilation. advantages of SIMV over AC is better patient ventilator synchrony, better preservation of respiratory muscle function lower mean airway pressure and good control over the support level.AC mode better for critically ill patients who require a constant tidal volume or full ventilatory support.

PRESSURE SUPPORT VENTILATION

Pressure support ventilation is a flow limited mode of ventilation that delivers inspiratory pressure until the inspiratory flow decreases to a predetermined percentage of its peak value.

CONTINUOUS POSITIVE AIRWAY PRESSURE(CPAP): CPAP refers to the delivery of a continuous level of positive airway pressure. It is functionally similar to PEEP during CPAP no cycling occurs in ventilator.no additional was given, all breaths should be initiated by the patients. CPAP most commonly used in sleep related breathing disorders , cardiogenic edema, hypoventilation syndrome of obesity.

CARE OF THE PATIENTS ON VENTILATOR adjunctive therapies and supportive therapies of the critically ill and ventilated patients are necessary to prevent infections and complications. Several protocols and

evidence based strategies are available to improve the quality of patient care and enhancing the efficiency, safety and efficacy of care.in early 2001,the institute for health improvement (IHI)formed a group of intensivists and experts to determine improvement priorities in critically ill ventilated patients.[26] Ventilated patients are at high risk of ventilator associated pneumonia and deep venous thrombosis and stress induced gastrointestinal bleeding. a group of evidence based practices are combined to give optimum results in the form of CARE BUNDLE. IHI instituted a VENTILATOR CARE BUNDLE under the 5 million campaign for prevention of ventilator associated pneumonia.

the main components of ventilator bundle are

1.elevation of the head end of the bed.

2.sedation vacations daily and assessment of readiness to extubate.

3.peptic ulcer disease prophylaxis

4.deep venous thrombosis prophylaxis

5.daily oral care with chlorhexidine.

ELEVATION OF HEAD END OF THE BED- Integral part of the ventilator bundle is head end elevation and has been correlated with decrease in the rate of ventilator associated pneumonia. 30 t0 45 degrees is the recommended elevation. Avoiding the risk of aspiration of

nasopharyngeal, oro pharyngeal and gastrointestinal contents was the reason for recommendation. Respiratory function dynamics improved by this position.

DAILY SEDATION VACATIONS AND ASSESSMENT OF READINESS TO EXTUBATE- sedation and analgesics are frequently used for critically ill patients to ensure patient safety, to reduce stress and oxygen consumption, to relieve pain and anxiety and to prevent patient ventilator dysynchrony. Very high sedation has harmful side effects. scientific advances revealed these medications has increased morbidity like hypotension,decreased intestinal motility, incresed risk of venous thrombosis ,reduced tissue oxygenation, polyneuropathy and prolonged stay.epidemic of cognitive and functional brain impairment also reported.the rule of CCC (calm, comfortable,collaborative) advocated by vincent determines appropriate sedation of the patients. ABCDE approach by Vasilevskis E et al is evidence based and organised. This includes 1.Awakening

2.Breathing coordination of daily sedation and ventilator removal trials

3.choice of sedative or analgesic exposure

4.delirium monitoring and management

5.early mobility and exercise.

STRESS ULCER DISEASE PROPHYLAXIS-The most common cause of gastrointestinal bleeding in icu is due to stress ulceration.ventilated patients lack the ability of airway defence.nasocomial pneumonia is high due to aspiration of gastric contents and oesophageal reflux.increased gastric pH by drugs and other agents will lead to growth of bacteria particularly gram negative bacilli from the duodenum.the use of H2receptor antagonists associated with reduced rates of nasocomial and ventilator associated pneumonia.sucralfate doesnot change the gastric pH and associated with reduced rate of VAP. Surviving sepsis campaign and prevention of HAP/VAP guidelines have supported the use ofH2 receptor antagonists for stress ulcer prophylaxis. Proton pump inhibitors also efficacious but not proved superior.

DEEP VENOUS THROMBOSIS PROPHYLAXIS- IT IS APPROPRIATE intervention in all patients who are sedentary ,bed ridden and sedated ventilated patients. if consistent prophylaxis applied the risk is reduced. Subcutaneous heparin (unfractionated or low molecular weight) unless contraindicated. mechanical prophylactic measures like intermittent pneumatic compression can be used if heparin cannot be used.

DAILY ORAL CARE WITH CHLORHEXIDINE- mechanical ventilated patients lack mechanical chewing and absence of saliva flow causes

dental plague biofilms that may be colonied by respiratory microbes leading to ventilator associated pneumonia. Topical decontamination with chlorhexidine reduces risk of VAP. some of the other interventions are hand washing,eye care ,eyes taped, artificial tears to prevent drying.changing position regularly, closed suction systems, heat moisture exchangers, reintubation is avoided, suction the subglottic region conmtinuously, frequent circuit change is avoided, glycemic control,transfusion restricted, postpyloric feeding, critically ill patients requires following ancillary care.[27]

FEEDING- malnutrition is major cause for complications and morbitidy.goal oriernted and more focussed nutrition therapy can attenuate the metabolic response to stress,oxidative cellular injury can be reduced and immune response can be modulated.gut mucosal barrier function is maintained by early enteral feeding.

ANALGESIA-Patient's psychological and physiological recovery is affected by pain. Good intensive care includes adequete pain relief.pain in critically ill patients is assessed by subjective measurements of pain related behaviour like facial expression,movement and indicators like heart rate, blood pressure should be used. continuous intravenous administration allows closer and more rapid titration to patient needs than intramuscular and other routes.

SEDATION HOLIDAY-High sedation is associated with harmful effects .this can be minimised by daily interruption of sedation with spontaneous breathing trials and minimal sedation use.

GLUCOSE CONTROL- Van der berghe et al showed tight control of blood glucose levels of 80-110 mg/dl resulted in reduction in mortality,infections and other morbidity than blood level higher than 200mg/dl,to avoid hypoglycemia blood glucose should be maintained at around 180 mg/dl

BOWEL CARE

INDWELLING CATHETER REMOVAL

DE-ESCALATION OF ANTIBIOTICS

EYE CARE- patients in intensive care units have impaired ocular protective mechanisms,resulting in risk of developing complications like corneal keratitis,conjunctival edema. this can be prevented by following methods

OPEN CHAMBER METHOD-ocular lubricants like hydroxypropyl methyl cellulose, carboxy methylcellulose,lacrilube and placing a securing tape.

CLOSED CHAMBER METHOD- moisture chamber is created by using swimming goggles and moistening eyelids with gauze soaked in sterile water every 12 hours.this methods is better than open method.

HUMIDIFICATION- under physiological conditions the upper airway adds heat and moisture to the inspired air to prevent drying of lower airway secretions,plugging and mucosal injury. the normal heat and moisture exchange of the airway is compromised when dry medical gases bypasses the airway through endotracheal tube.this function of physiological airway can be replaced by 2 ways.[28]

HEATED HUMIDIFIER- heated humidifier adds heat and humidity.it has humidification chamber composed of water and a heat source.gas may be passed over or bubbled through the reservoir.a heated wire inside the inspiratory limb may prevent gas cooling below its dew point and causing condensation.

HEAT AND MOISTURE EXCHANGERS(HME)- HME consist of an outer casing with an inlet and an outlet with partial barrier in between.these are placed closed to the patient,on the distal end of the ET tube.these are a compact, inexpensive, efficient and non energy requiring solution to humidification of relatively cool and dry inspired gases.

HEAT AND MOISTURE EXCHANGE FILTERS- these filters are the modified HME to prevent bidirectional passage of both airborne and waterborne pathogens. these arev most commonly used device.

Ventilator circuit changes should be changed once per week.

COMPLICATIONS OF MECHANICAL VENTILATION-mechanically ventilated patients are at high risk of mortality,not only from the primary condition that needed ventilatory support but also from complications arising directly or indirectly from mechanical ventilation itself.it can be classified as

1. Early and delayed

2. Ccomplications attributable to intubation,malposition and extubation.

3. Complications due to operation of the ventilator like machine failure,alarm failure.

4. Medical complications hypo/hyper ventilation, pneumothorax, pneumonia and hypotension.

VENTILATOR ASSOCIATED PNEUMONIA(VAP)-it is defined as pneumonia occuring more than 48 hrs after the patient have been intubated and received mechanical ventilation. it is classified into early onset and late onset.

1.EARLY ONSET VAP(2-5 days) is caused by antiboitic sensitive pathogens and carries better prognosis.

2.LATE ONSET VAP(after 5 days) is caused by MDR pathogens and carries poor prognosis.most of the critically ill patients are often immunocompromised and are susceptible to nosocomial pneumonia.the common organism include gram negative aerobic bacilli like peudomonas aeruginosa,E.Coli,klebsiella and acinetobacter species.MRSA infection is on the rise.source of microorganism is by

a)endogenous aspiration from oropharynx,trachea,nasal carriage,sinusitis and gastric fluids.

b)exogenous inhalation from health care worker,ventilator circuits,nebulizer and biofilms.

c)hematogenous,direct inoculation and bacterial translocation,bacterial sinusitis are also the sources.

PHYSICAL STRATEGIES TO PREVENT VAP

Orotracheal route of intubation is preferred over nasotracheal route.

orogastric tube instead of nasogastric tube.

ETT CUFF pressure should be maintained to prevent aspiration.

CLINICAL CRITERIA FOR VAP.

1.abnormal chest x ray (new or progressive radiographic infiltrate

2.atleast any two of the following

a)leukocytosis>12000/cubic mm

b)leucopenia<4000/cubic mm

c)fever 38deg C.

d)hypothermia 35deg C

e)purulent tracheobronchial secretion.

Gold standard for diagnosis of VAP is the histopathologic examination and culture of lung tissue. respiratory tract sampling like bronchoscopic BAL, non bronchoscopic miniBAL,tracheobronchial aspiration are done for gram stain microscopic analysis and quantitative culture.biological markers like procalcitonin,CRP,sTREM-1 can be done.

VENTILATOR INDUCED LUNG INJURIES. barotrauma,volutrauma,atelectrauma,biotrauma are injuries can cause morbidity.

SEPSIS: Sepsis, severe sepsis and septic shock are the grave stages of the systemic inflammatory response to severe infection. Reported mortality rates of severe sepsis and septic shock still remain at 40–60%

today and have not changed significantly in the past 20 years. inspite of intense research and recent advances in diagnosis and treatment, sepsis patients suffer considerable long-term morbidity. cellular mechanisms of sepsis and underlying causes will be discussed in the following sections. simple infection to septic shock progression and multiorgan failure is discussed and current treatment methods explained in the following sections that will help to improve postoperative care.[29]

DEFINITIONS AND DIAGNOSIS OF SEPSIS

Infections and sepsis is difficult to diagnose in spite of frequent admissions in intensive care unit. The following definitions may be helpful and provide the clinician with the accurate nomenclature for the diagnosis and management of infections. Systemic inflammatory response syndrome (SIRS), sepsis, severe sepsis and septic shock are thought to represent increasing severity of disease. The human body liberates cytokines to different stresses which can clinically present as a SIRS. hence systemic inflammatory response syndrome(SIRS) may be seen not only following infection but also after major surgery and severe trauma, making the diagnosis of sepsis potentially difficult. The origin of the SIRS must be searched and it is of the utmost importance, because this time delay may prove significant for the patient. The definition of sepsis needs only SIRS and the suspicion of infection and

positive cultures are not essential for the diagnosis of sepsis. A thorough examination at the bedside of the patient by an experienced clinician is essential. Fluid resuscitation of the patient is also included in diagnosis and treatment of sepsis and plays a vital role.

Nomenclature for the diagnosis and management of infections

INFECTION: invasion of the body by organisms

SIRS : Two or more of the following

Temperature >38°C or <36°C

Heart rate >90/min

Respiratory rate >20/min or minute volume >10 L/min

wcc < 4 × 102/L in ventilated patients

PaCO2 <4.3 kPa

white cell count >12 000/mL or >10% immature forms

SEPSIS : SIRS plus the clinical suspicion of infection

SEVERE SEPSIS : Sepsis plus evidence of organ dysfunction

SEPTIC SHOCK : Sepsis plus hypotension refractory to volume resuscitation

Multiorgan failure : Failure of >2 organ systems.

sepsis represents a disease complex with potential involvement of several organ systems-multiorgan failure and it should not be considered as a single disease entity. sepsis often presents clinically with hypoperfusion of organs, the clinical signs of decreased organ perfusion include-

1.low blood pressure and hypotension

2.oliguria

3.confusion or drowsiness

4.angina or signs of myocardial ischaemia on 12-lead ECG 5.metabolic-lactic acidosis.

The Most common locations of the septic focus are

1.lungs

2.abdomen

3.genitourinary tract

4.central nervous system

5.skin

6.indwelling catheters.

THERAPEUTIC PRINCIPLES- the "GOLDEN HOUR OF SEPSIS"

The principles of sepsis treatment includes 1.early goal-directed therapy 2.source identification and control 3. early antibiotics 4.steroids 5. activated protein C and 6. tight glycaemic control.

Early goal-directed therapy : the cornerstones of therapy for sepsis is early adequete fluid resuscitation and source control of the infectious focus. diagnosis and therapy should be made simultaneously to minimize the delay in treatment.the ‘golden hour’ in trauma care,after the insult is a widely acceptable concept and should be equally applied to the sepsis treatment.early goal directed therapy refers to maintainence of adequete end organ perfusion by fluid resuscitation. This will minimize mitochondrial damage and finally organ failure. "Rivers and co-workers were able to show significant decrease in hospital mortality due to sepsis from 46.5% in the standard group to 30.5% in the early goal-directed therapy group by introducing an early (within 6 hours of admission)and aggressive therapeutic approach". Whether crystalloids or colloids are the optimal choice for resuscitation is still under debate. Blind administration of fluids should be avoided, Fluid challenges according to the patient’s requirements should be followed. Cardiac output should be optimized. Initial phase(10-15 minutes) includes rapid administration of 250 mL of colloid or 500 mL of crystalloid to the septic patient and adjusted according to the clinical response and reversal of clinical signs

of hypoperfusion like restoration of skin perfusion, blood pressure, urine output, metabolic acidosis. The central venous line insertion, urinary catheterisation and securing arterial line may help facilitate diagnosis and treatment in severe cases. the threshold of cardiovascular system should be borne in mind and pulmonary congestion should be avoided. Rivers et all advocated fluid administration for a CVP of 8–12 mmHg. If fluid challenges failed to maintain blood pressure ,vasopressors such as norepinephrine or vasopressin might be considered to target a MAP of >65 mmHg. Dopamine (vasopressor of choice in sepsis still today) has less favourable 28 day mortality than norepinephrine. A MAP target of >65 mmHg, advised by experts and targeting higher MAP, exposing patients to higher doses and prolonged treatment with vasopressors seems to have less favourable outcomes. Restoration of adequete cardiac output is the next goal of early goal-directed therapy. restoration of fluid status and blood pressure followed by aiming for a central venous saturation (ScvO2) of >70% has been advocated. "ScvO2 is a used as a surrogate for peripheral oxygen extraction assuming that peripheral oxygen extraction is inversely related to Cardiac output. " hematocrit of 30% (hemoglobin>10 g/dl) is needed to acheive ScvO2 >70% for which allogenic blood transfusion can be given.

Inotropes such as dobutamine or epinephrine (adrenaline) may be used to increase CO after acheiving the above said parameters.The use of a combination of norepinephrine and dobutamine for septic shock has better outcomes comparable to the use of epinephrine alone.

SOURCE IDENTIFICATION AND CONTROL: the initiation of treatment of sepsis, identification and eradication of the source of infection is to carried out simultaneously. appropriate samples for microbiology should be taken if there is adequete time and additional imaging should be considered before starting antibiotic therapy. microbiology sample of blood cultures taken from all indwelling catheters and simultaneously taken peripheral stabs, respiratory samples, sample fluids from all drains urinary catheter, wound drains, spinal or ventricular drains. bronchial lavage both direct and non direct in ventilated patients provides more accurate results. Gram staining though has pitfalls can help in selecting antibiotics in emergencies. septic focus for example intra- abdominal abscess if identified during imaging, image-guided percutaneous drainage may be considered at the same time can avoid another surgery. hence diagnostic as well as therapeutic options, can avoid further progression of sepsis.

EARLY ANTIBIOTICS: patients with severe sepsis and septic shock must receive appropriate antibiotics within the first hour of diagnosis.

Each hour of delay in antibiotic administration for the initial 6 hours is associated with a decrease in survival. The choice of antibiotic is based on several factors, such as the patient's underlying disease, whether the infection is community or hospital acquired and the antimicrobial resistance. Immunosuppressed patients and neutropenic patients, including post splenectomy patients would have acquired different infections from immunocompetent patients, and the antibiotic selected according to this special situation. hospital-acquired infections tend to involve more resistant pathogens than community acquired infections and has pathogens with a different antimicrobial spectrum, which will be more difficuIt to treat. the principle of treatment for severe sepsis and septic shock should always entail early broad-spectrum antibiotic coverage.microbiology results and special situations as said above should be considered and narrowing of antimicrobial spectrum can be done. Antibiotic usage as per the "Guidelines of antimicrobial treatment" are shown to be beneficial for patient's outcome and also helpful for the less experienced clinicians. Guidelines should also consider the duration of treatment for common clinical situations.prolonged antibiotic treatment can promote microbial resistance.microbiologists advice at regular intervals and infection control teams advice should be sought to avoid increasing local antibiotic resistance. antibiotic consumption and resistance rates are highest in intensive care unit.This gives the intensivist

the special responsibility in antibiotic stewardship to avoid spiralling antimicrobial resistance.

Steroids in sepsis: the use of corticosteroids in sepsis has been controversially discussed for a decade.apart from the common and known side effects of corticosteroids, specific beneficial effect in sepsis include inhibition of cytokines and iNOS and potential to reverse septic shock. Adverse effects include hyperglycaemia, risk of superinfections and an increased incidence of polyneuromyopathy. "Since the late 1980s several trials have failed to show survival benefit from the use of pharmacological doses of corticosteroids in sepsis (i.e. hydrocortisone 100 mg t.d.s.). In addition, timing of treatment (early versus late) did not show beneficial effects on outcome. However, this research also revealed that sepsis has the potential to increase adrenal dysfunction and tissue resistance to corticosteroids". This new insight has allowed a follow-up on the concept of steroid treament. "Annane and co-workers were able to demonstrate beneficial effects of low-dose early treatment with corticosteroids (hydrocortisone 50 mg q.d.s. and fludrocortisone 50 μg o.d.) in patients with inadequate adrenal response." Based on this multicentre RCT, many clinician worldwide have started to use steroids for patients in septic shock requiring vasopressors. another multicentre RCT of low-dose early corticosteroids failed to confirm these beneficial

effects,but Corticus trial was also able to confirm earlier reversal of shock with the use of hydrocortisone. This has finally led the Surviving Sepsis Campaign to recommend that "hydrocortisone should be considered in the management strategy of patients with septic shock after blood pressure is poorly responsive to fluid resuscitation and vasopressor therapy".

Strict glycaemic control : the elevation of blood glucose in the presence of acute illness is called as stress induced hyperglycemia. endogenous and exogenous stress hormones such as epinephrine, cortisol and cytokines contribute to the sepsis by potentially inhibiting insulin release and action, thereby enhancing gluconeogenesis and inhibiting glycogen formation. In addition administration of intravenous glucose, parenteral nutrition and a group of medicines during intensive care can also contribute to hyperglycaemia. hyperglycaemia reflects the severity of disease and hyperglycaemia can be linked with worse outcomes in non-diabetic patients admitted to the intensive care unit.there is inverse relationship between the duration of exposure to higher glucose concentrations and survival of the patient.hence strict glycaemic control emerged as primary protocol in the treatment of critically ill patients."Van der Berghe and co-workers were able to demonstrate more favourable outcomes in a large single-centre trial if blood glucose was

kept in a tight range (4.4–6.1 mmol/L) than with a more conventional approach (target 10–11 mmol/L)". Patients on tight glycemic control had decreased mortality,fewer days of ventilation and shorter duration of stay on the intensive care unit than controls.however more episodes of hypoglycaemia were reported in the treatment group. there is evidence that hypoglycaemia is associated independently with increased mortality in the critically ill. Therefore, recent recommendation is to target a blood glucose range of 6–10 mmol/L in non- diabetic critically ill patients. it can be achieved best by administering short-acting insulin by continuous intravenous infusion according to local protocols,steps to minimize and treat hypoglycemia are important.

MATERIALS AND METHODS

PLACE OF STUDY :

Rajiv Gandhi Government General Hospital and Madras Medical college, Chennai.

TYPE OF STUDY :

Prospective observational study.

DURATION OF STUDY:

March 2016 to September 2016.

SAMPLE SIZE:

50 Patients.

INCLUSION CRITERIA:

Patients over the age of 18 who are all in mechanical ventilator in post operative period.

EXCLUSION CRITERIA:

1. Patients who are mechanically ventilated preoperatively for a non surgical cause.

2.Patients with associated head, chest injuries and poly trauma.

3.Pregnant women and children.

METHODOLOGY:

This will be a hospital based time bound study. All those cases which satisfy the inclusion criteria will be included in this study.All patients will be taken into the study after obtaining written informed consent.all the patients who fit into the criteria will be done routine blood investigations like hemoglobin, hematocrit, liver function test, renal function test, serum electrolytes and ABG. Serial bedside Chest X ray and ecg will be done.

following data will be collected.

1.History and clinical examination.

2.Previous comorbities.

3.Associated risk factors.

4.Surgical procedure and duration.

5.Anesthesia procedure.

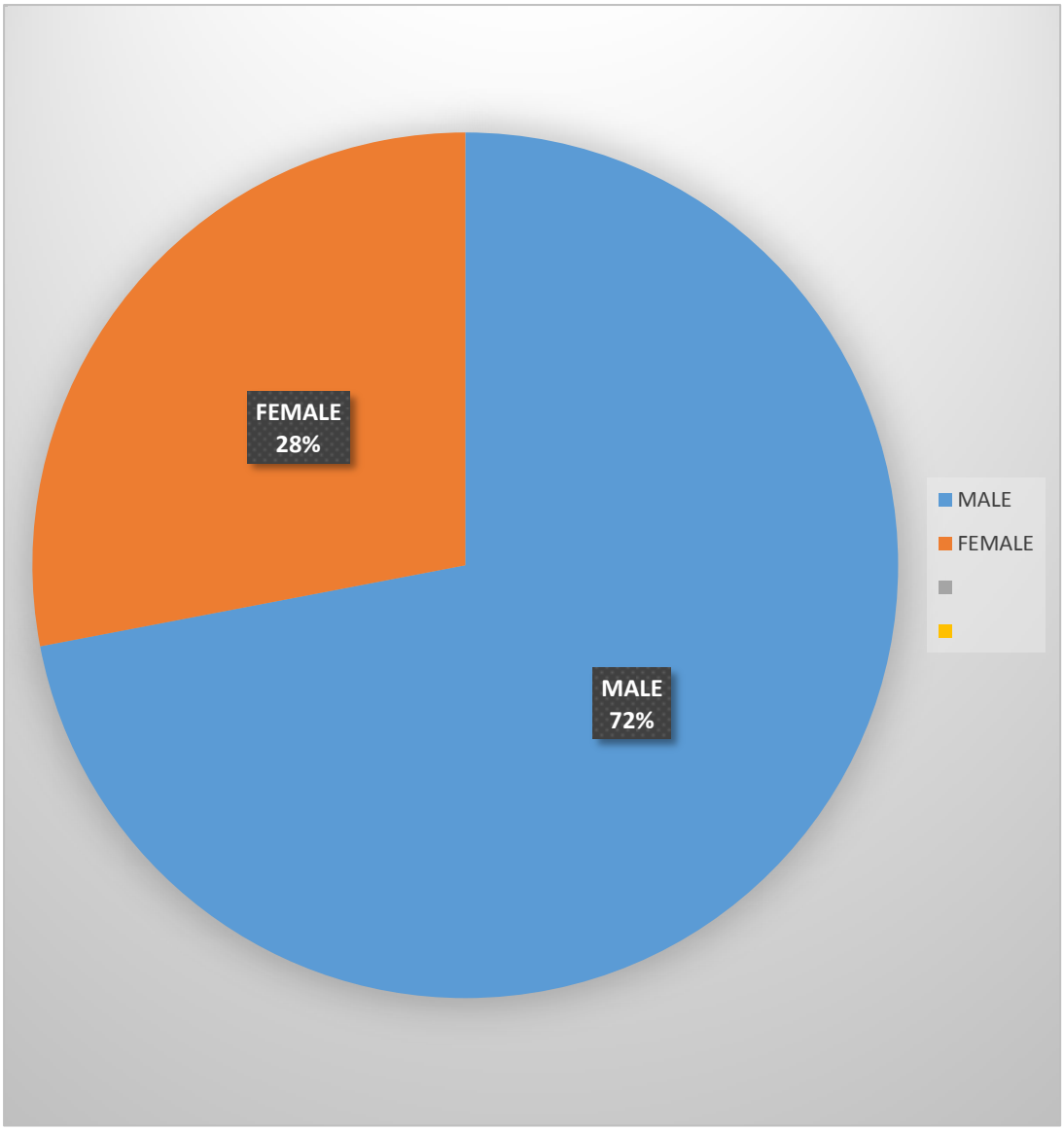
6.Modes of ventilator.

7.Vital parameters - SIRS Criteria.

patients will be followed up till death or discharge.

OBSERVATION AND ANALYSIS

SEX DISTRIBUTION



AGE DISTRIBUTION

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21-30	5	25	125	50	-25	625	3125
31-40	5	35	175	50	-15	225	1125
41-50	6	45	270	50	-5	25	125
51-60	17	55	935	50	5	25	425
61-70	14	65	910	50	15	225	3150
71-80	3	75	225	50	25	625	1875
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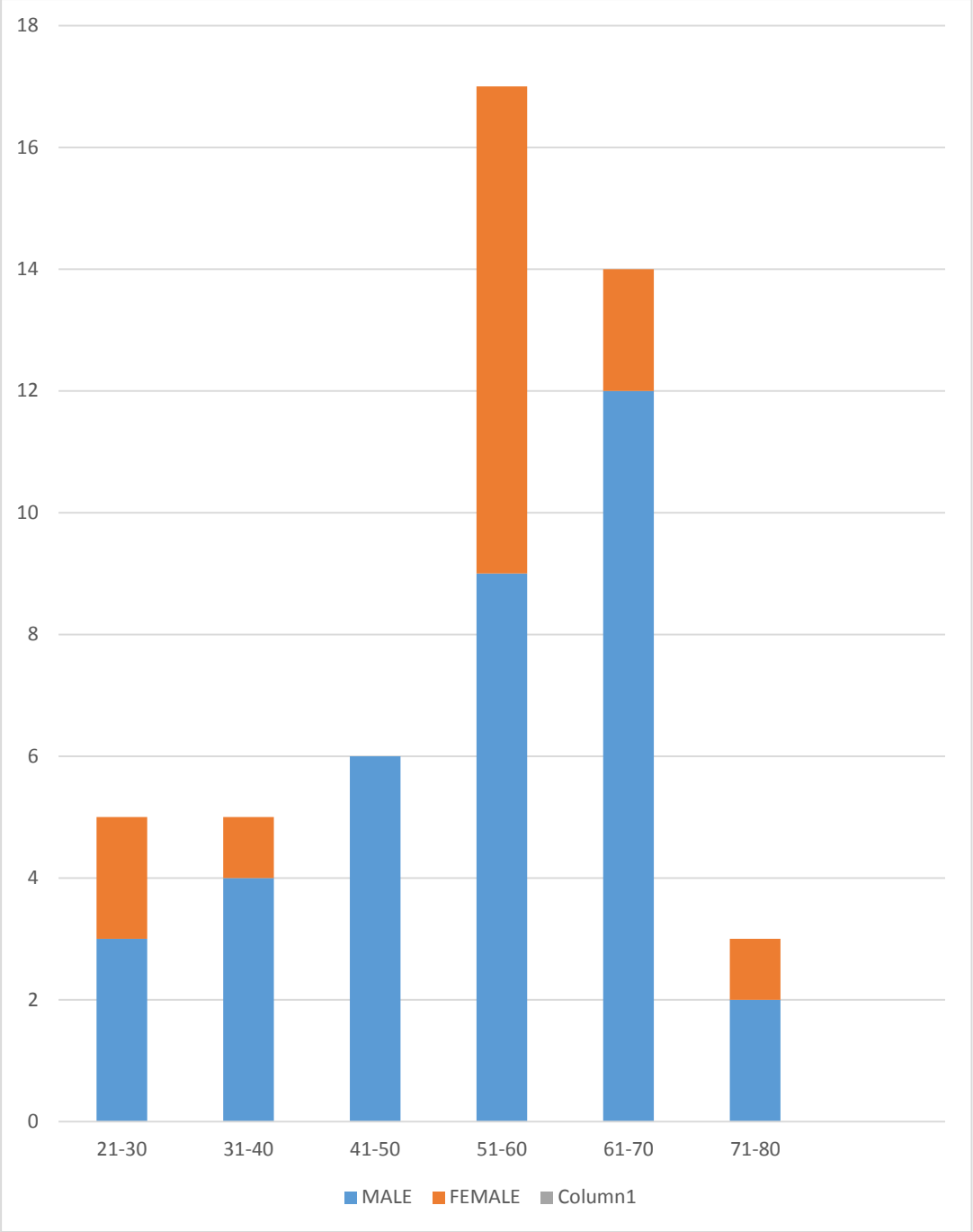
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MALE
FEMALE
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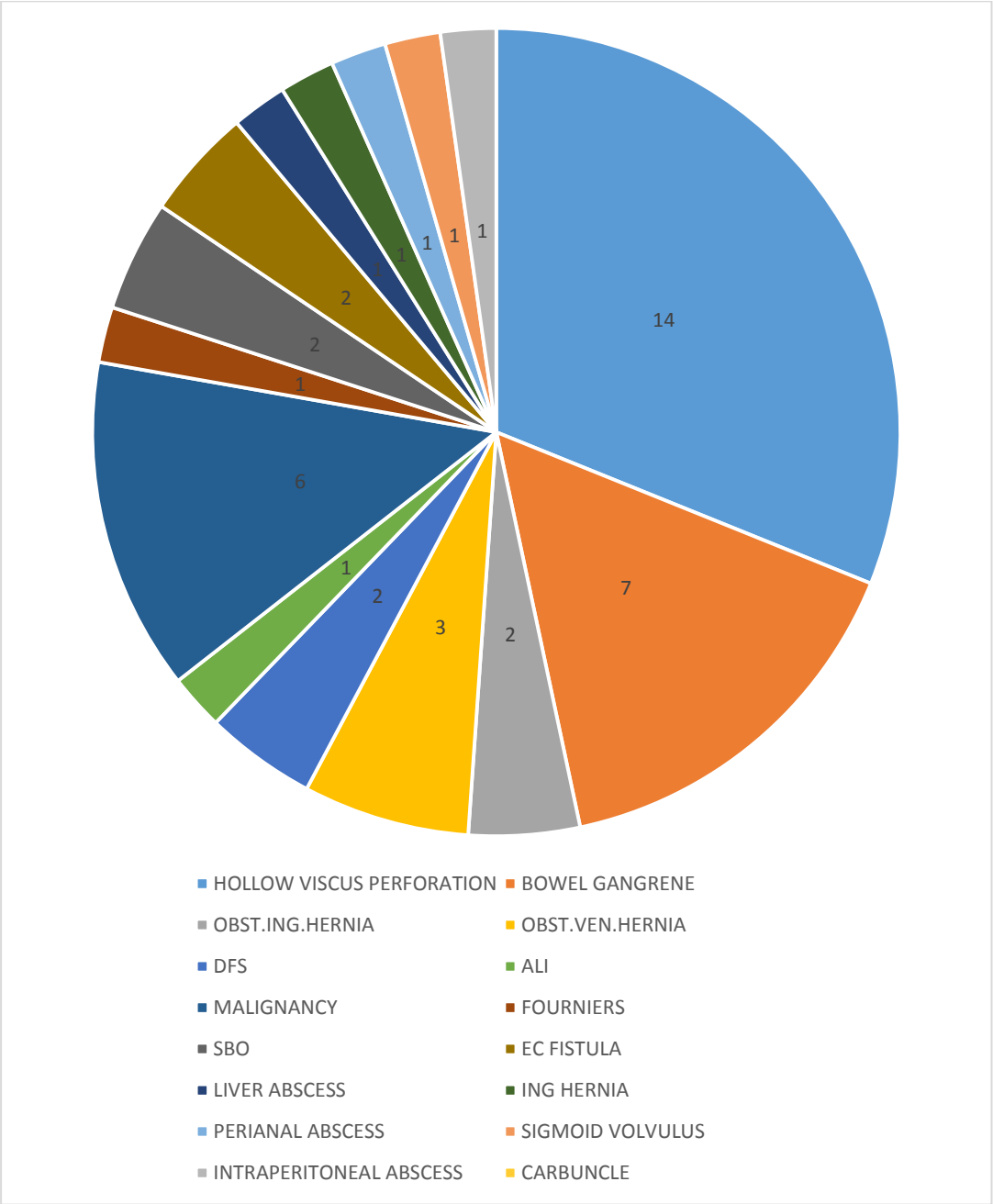
DIAGNOSIS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HOLLOW VISCUS PERFORATION
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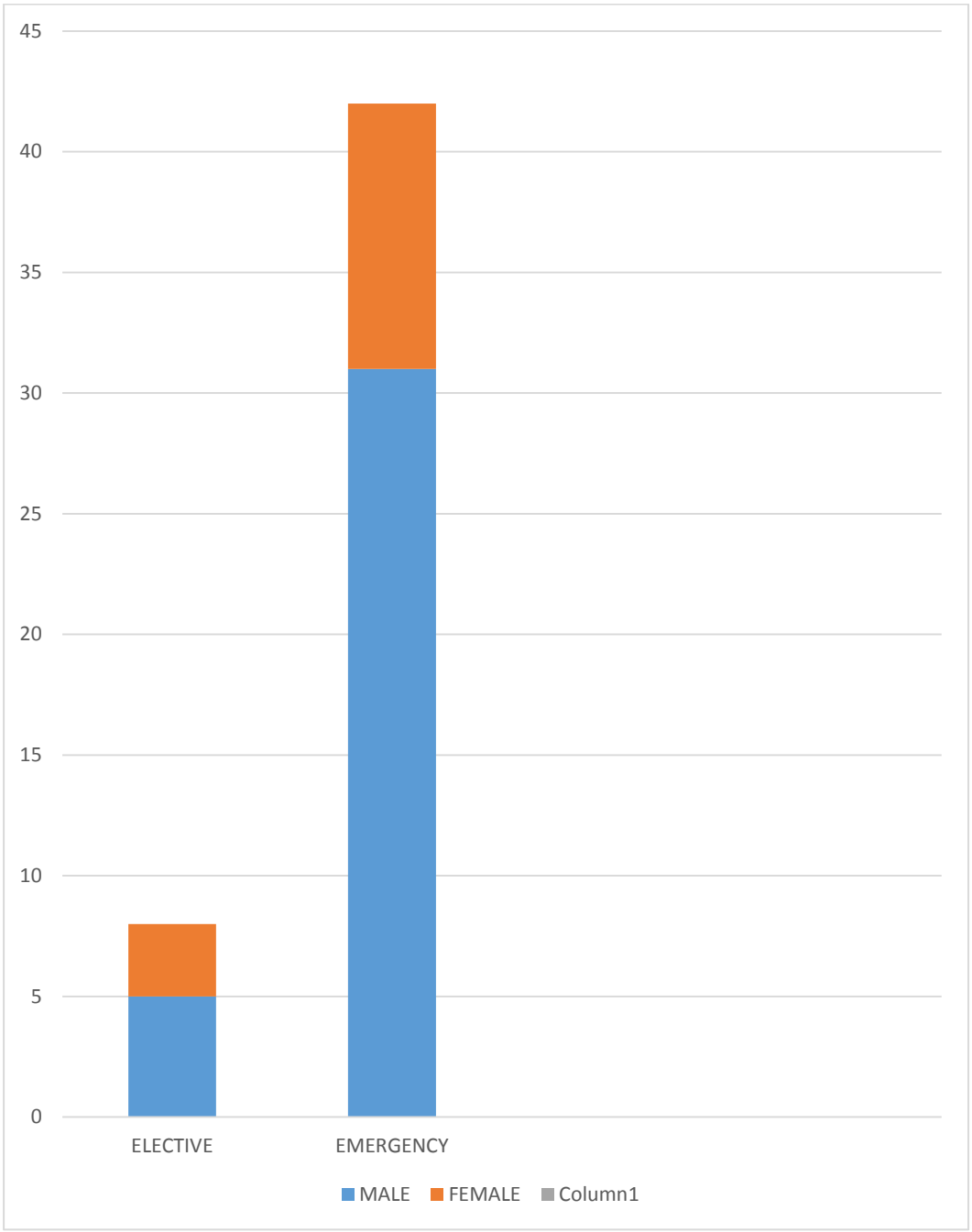
OBST.ING.HERNIA
OBST.VEN.HERNIA
DFS
ALI
MALIGNANCY
FOURNIERS
SBO
EC FISTULA
LIVER ABSCESS
ING HERNIA
PERIANAL ABSCESS
SIGMOID VOLVULUS
INTRAPERITONEAL ABSCESS
CARBUNCLE

PROCEDURE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ELECTIVE
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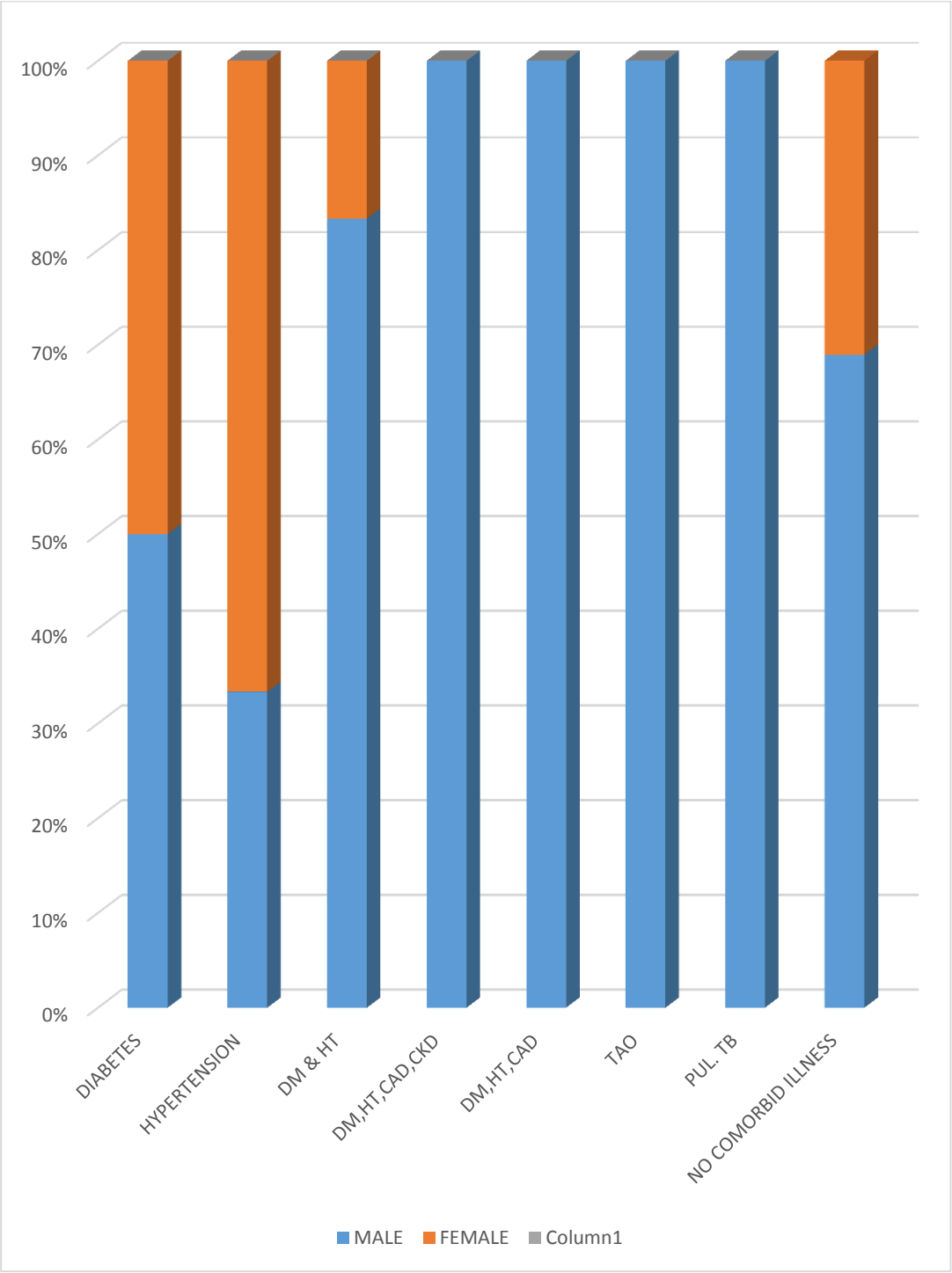
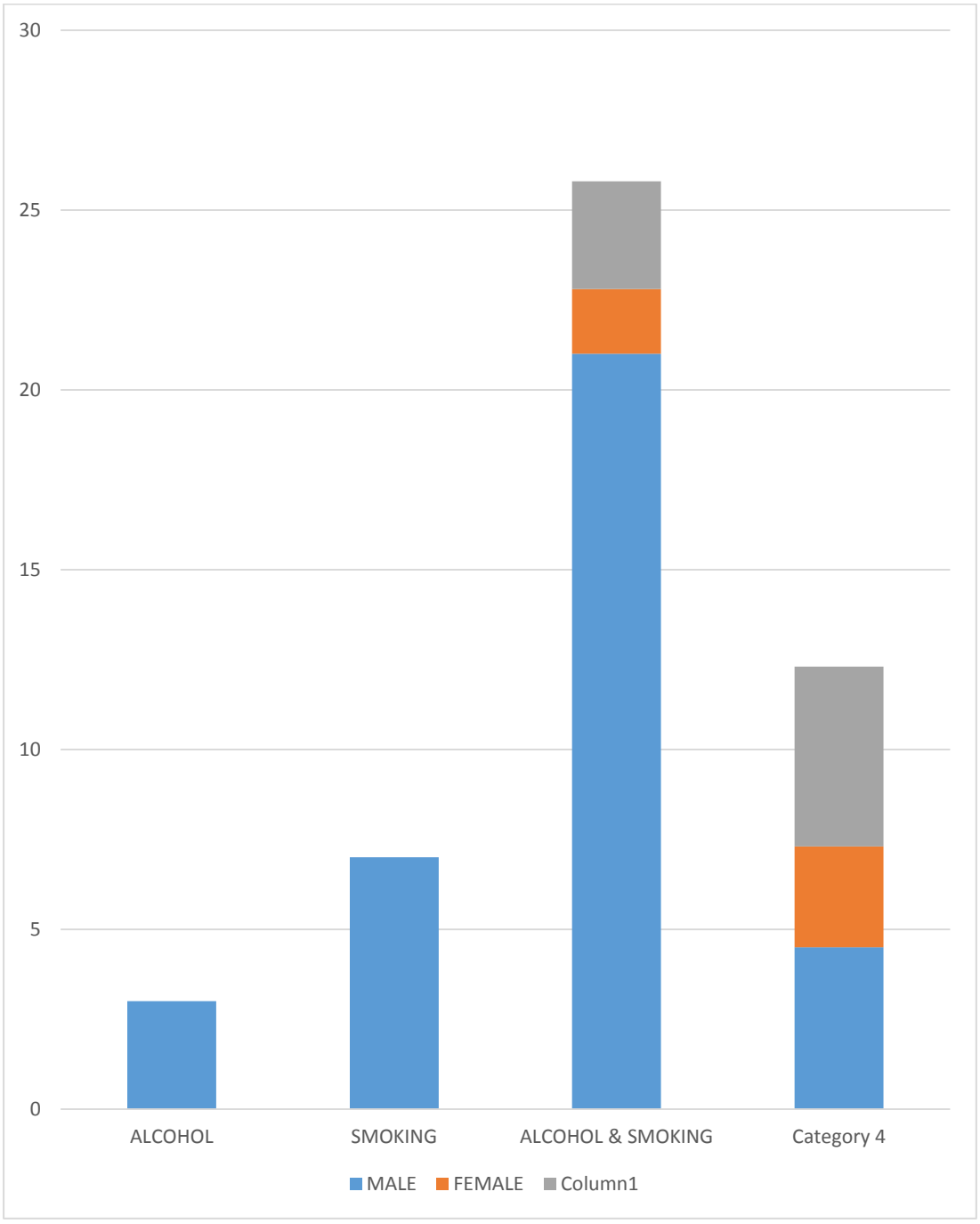
Column1

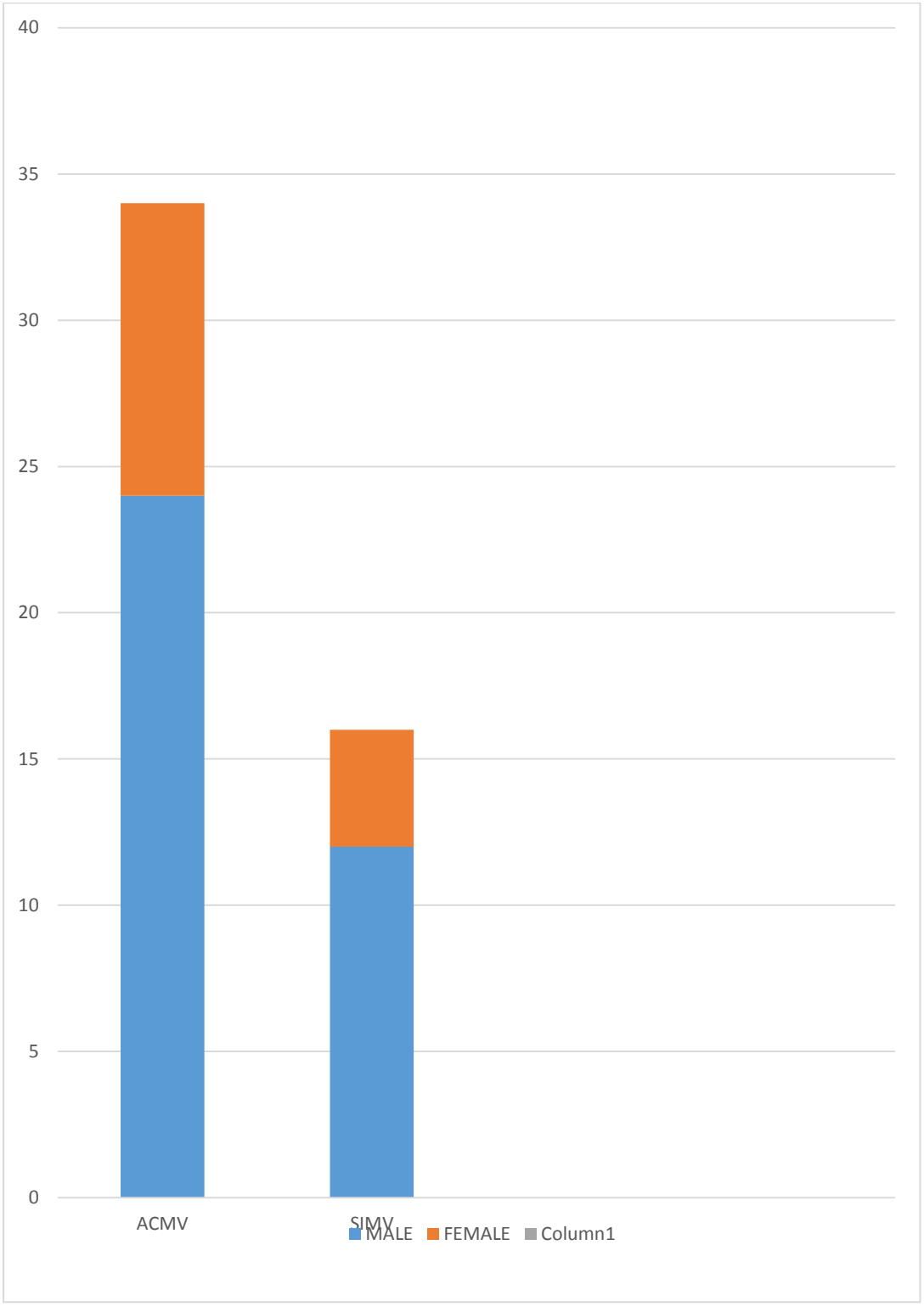
COMORBID ILLNESS



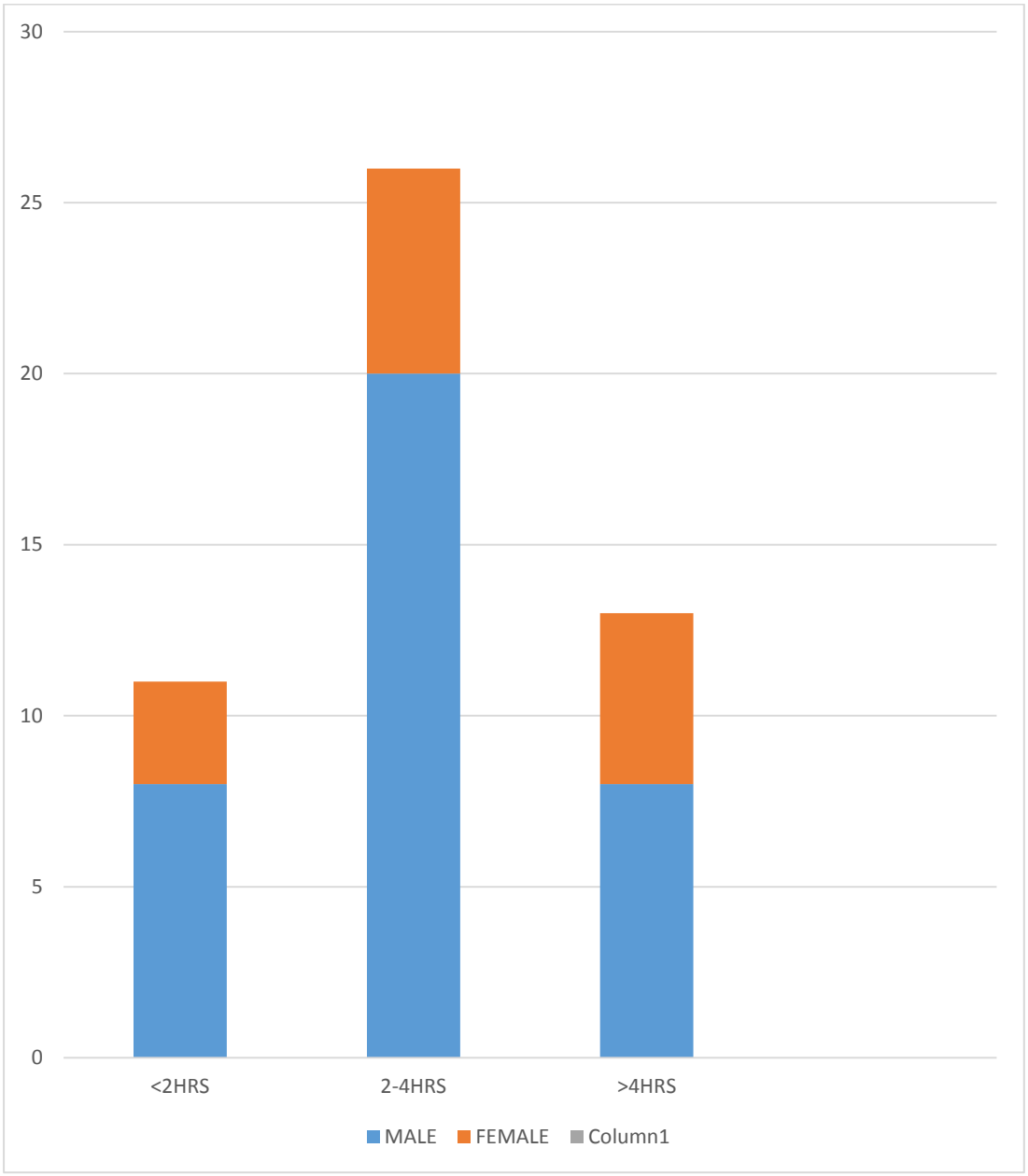
RISK FACTORS



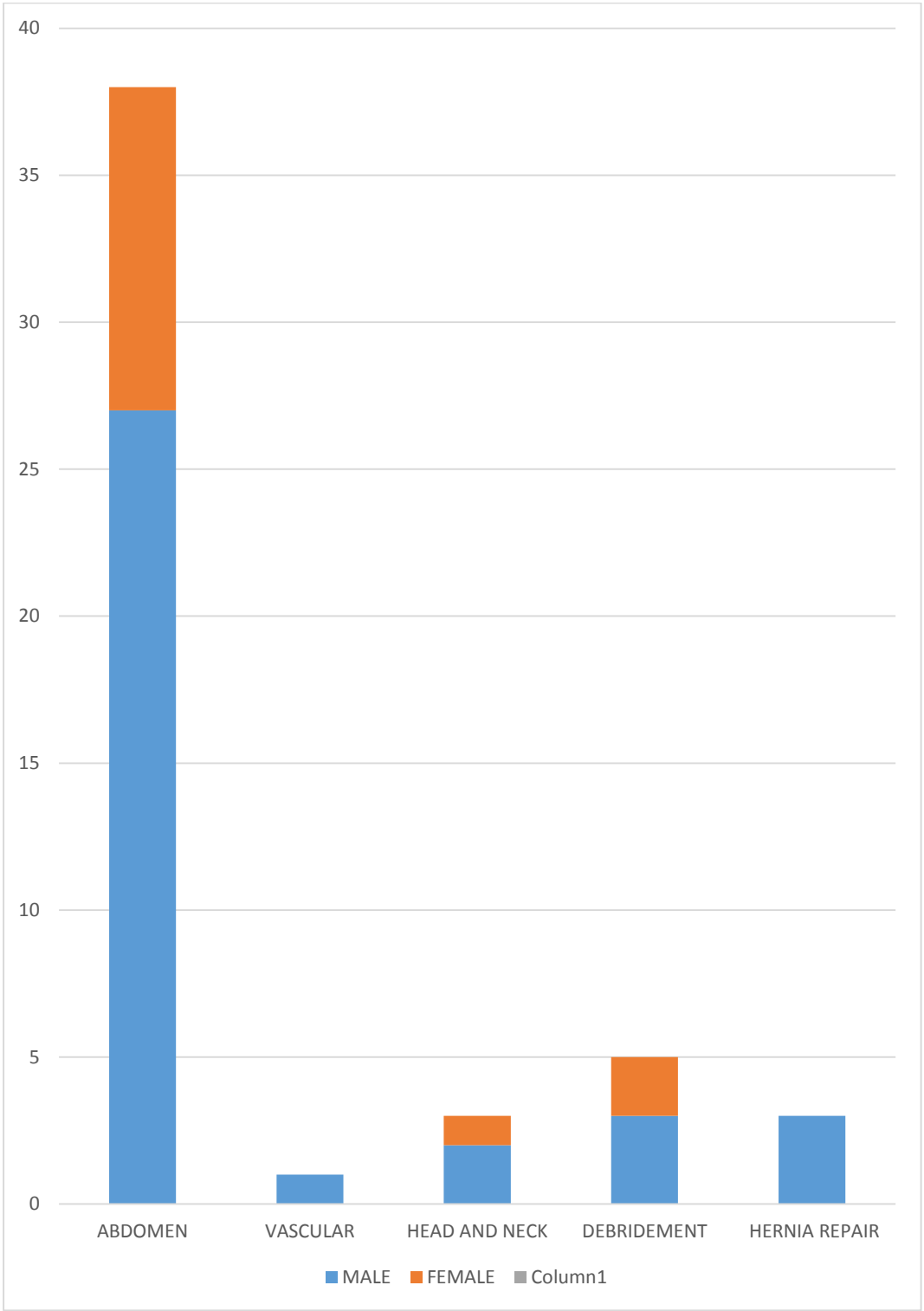
MODE OF VENTILATION



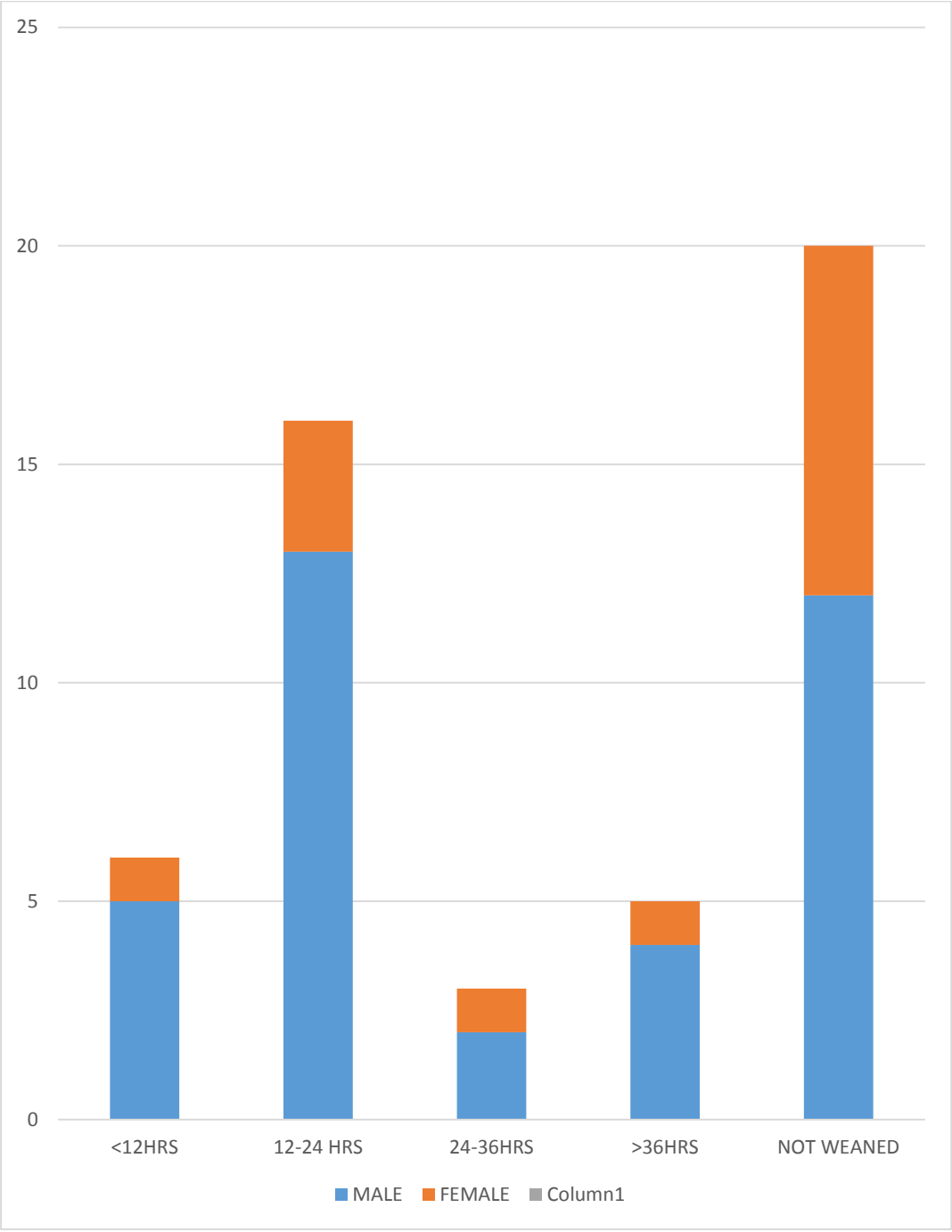
DURATION OF SURGERY



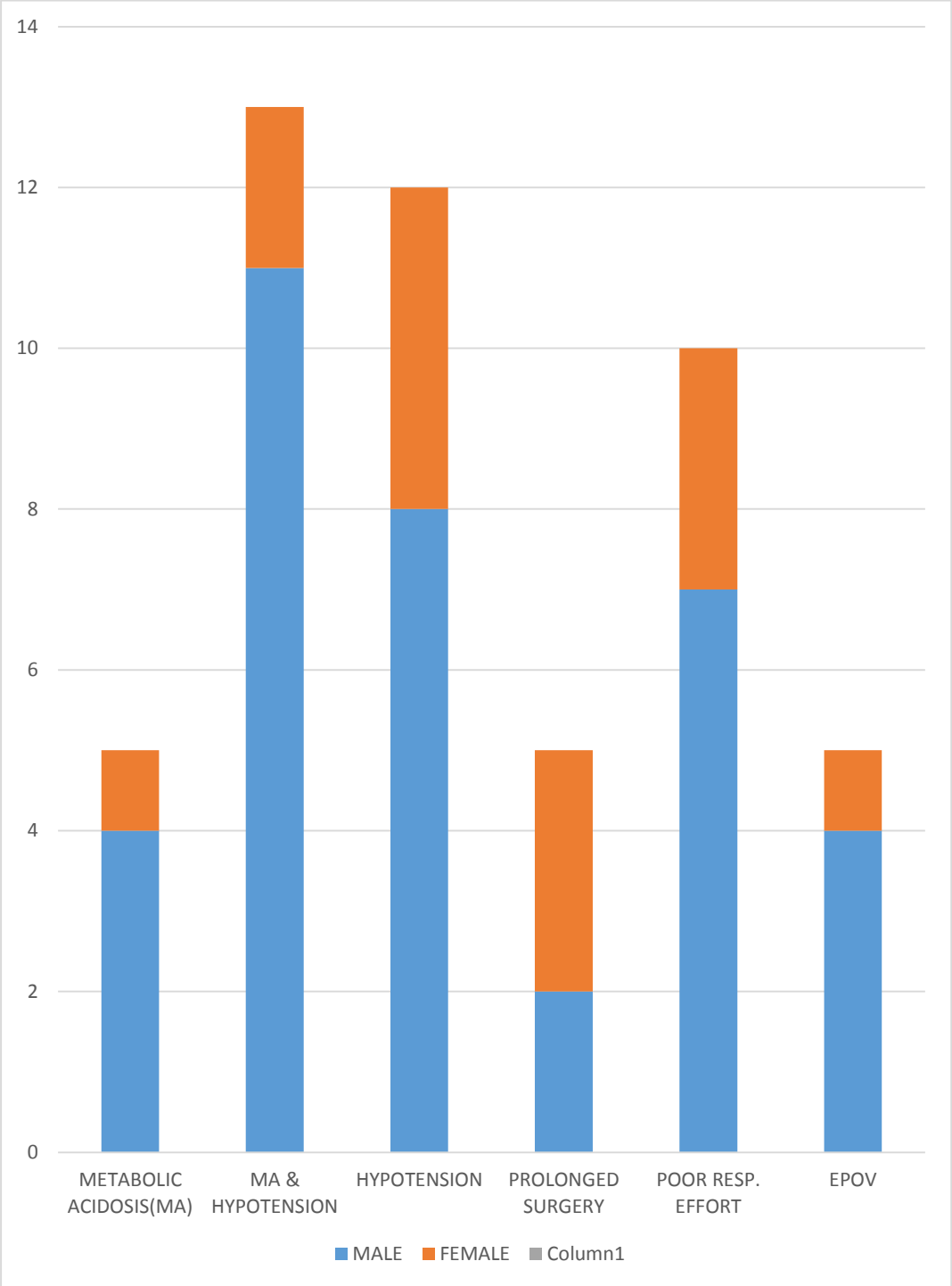
REGIONAL CLASSIFICATION



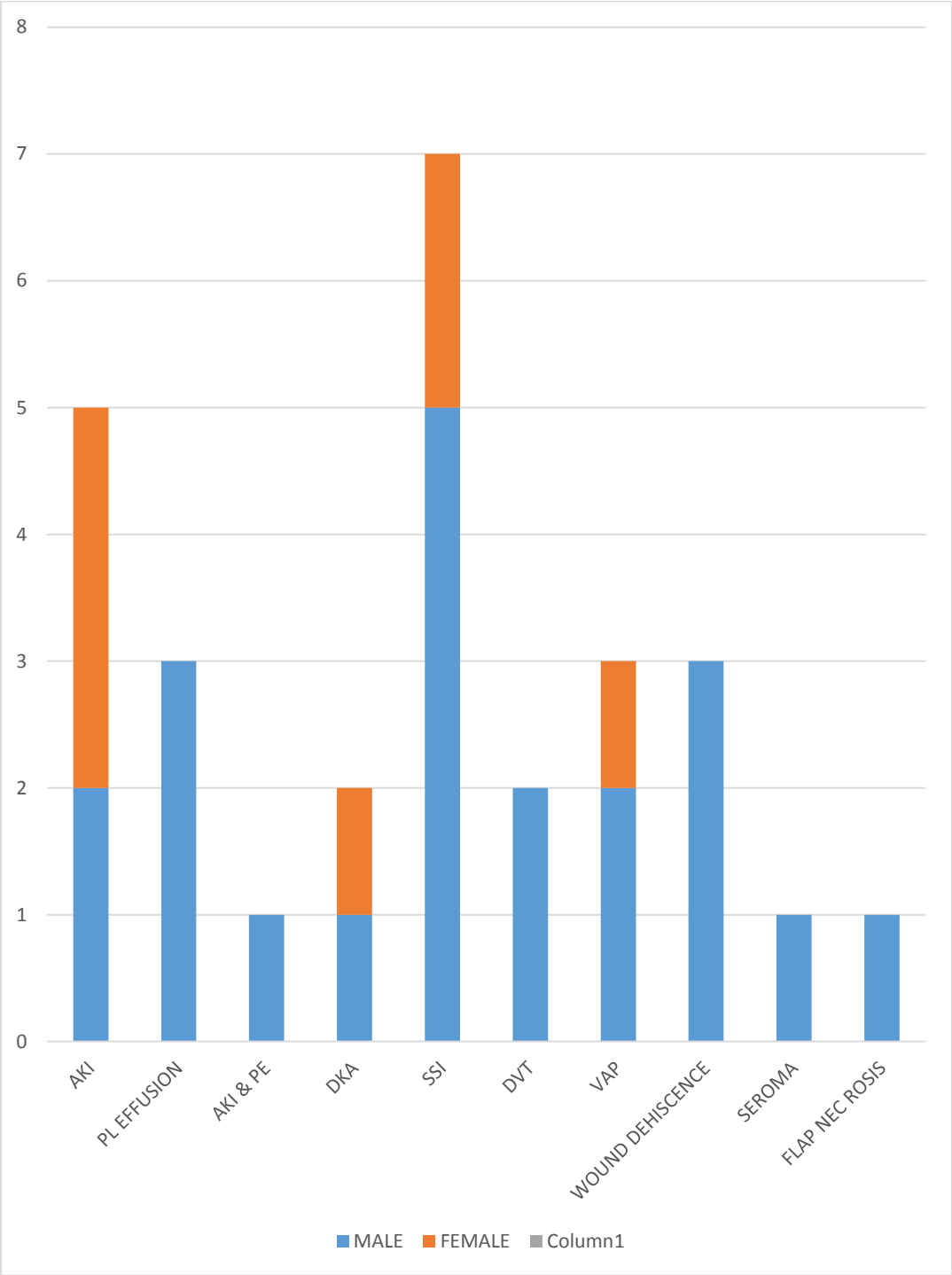
DURATION OF WEANING



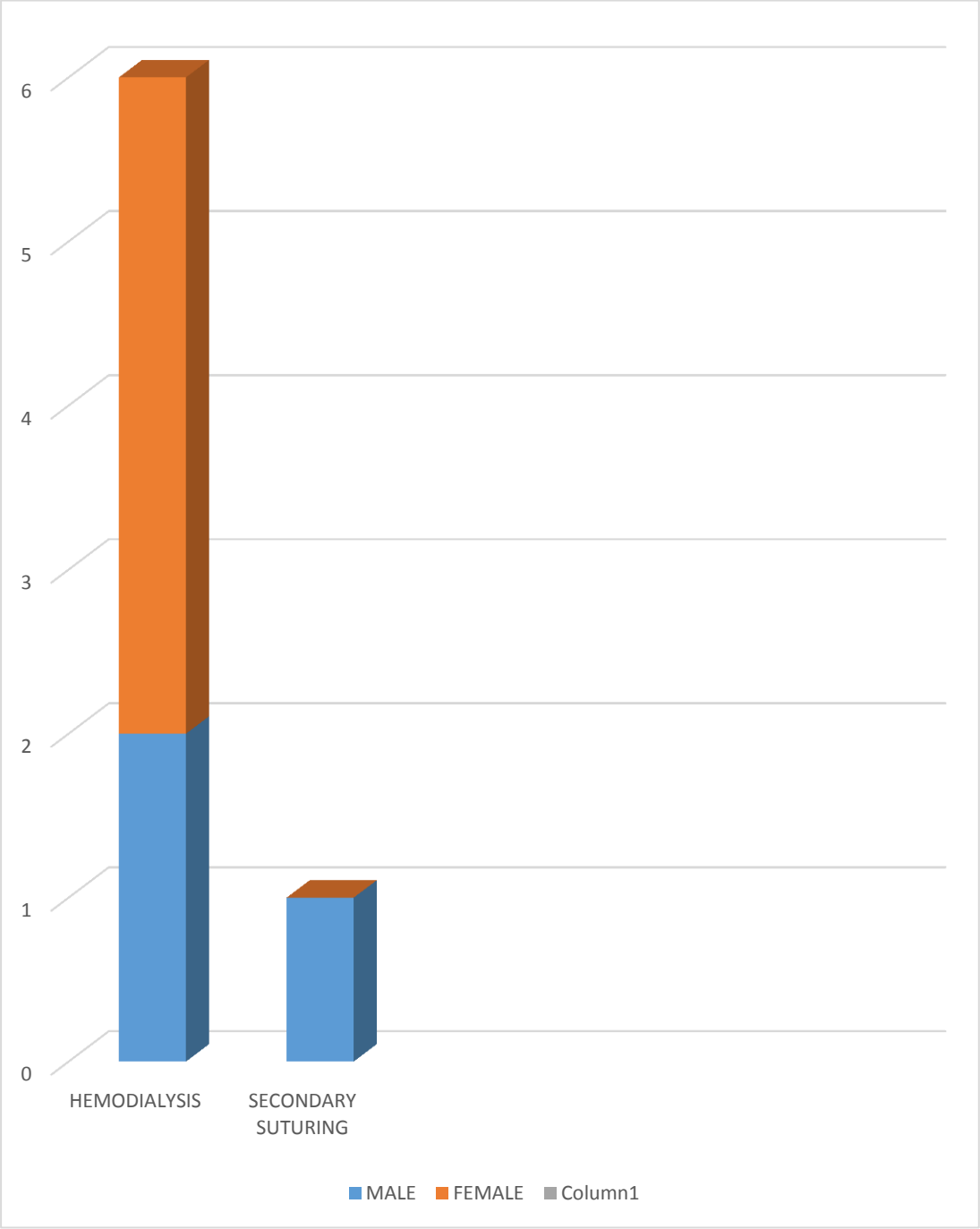
COMPLICATIONS PRECLUDING EXTUBATION



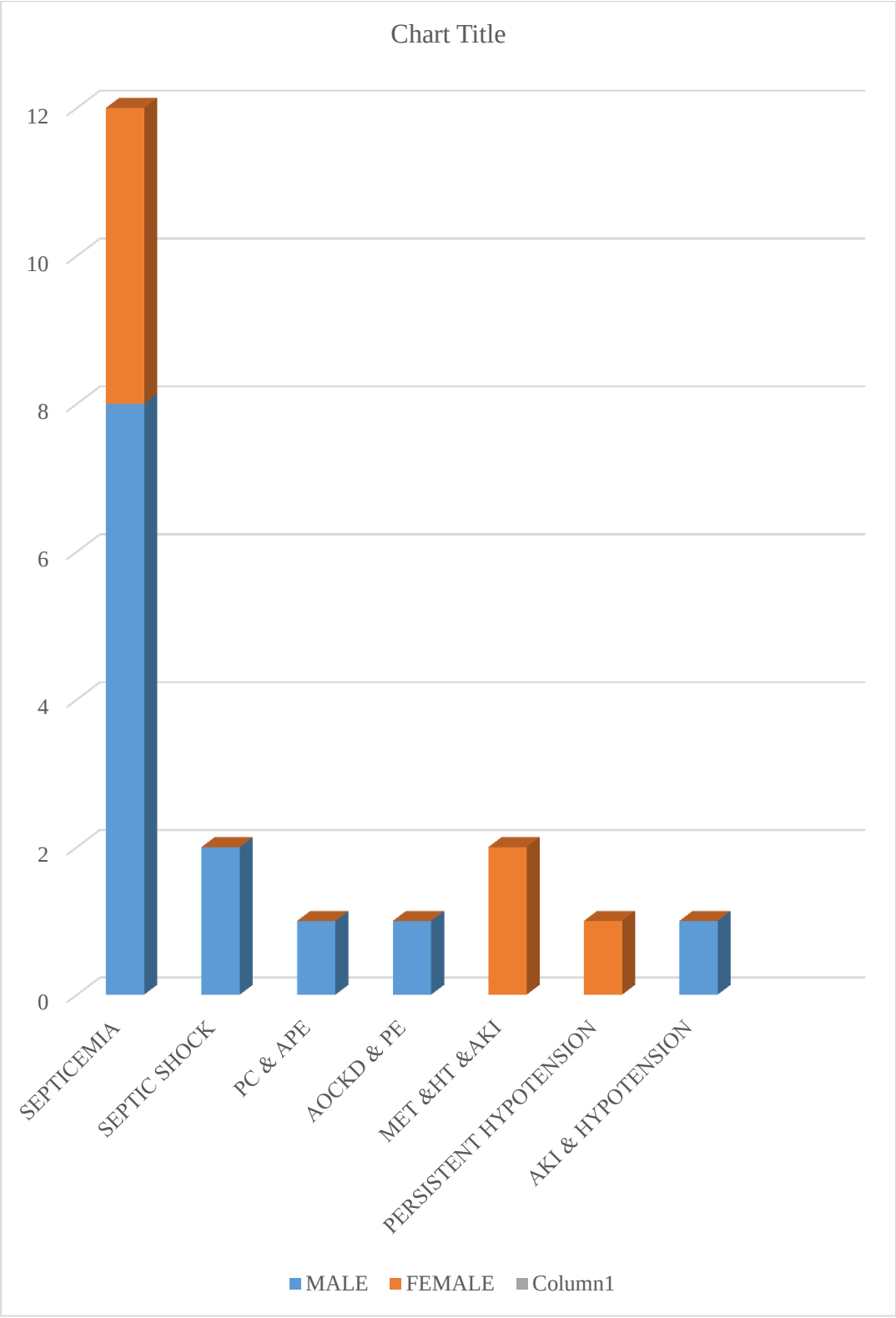
COMPLICATIONS



INTERVENTIONS



CAUSE OF DEATH



SIGNIFICANCE OF AGE OF THE PATIENT

Age	Male	Female	Total	Male death	Female death	Total death	P vaule
21-30	3	2	5	0	0	0	0.24
31-40	4	1	5	2	0	2	0.19
41-50	6	0	6	1	0	1	0.16
51-60	9	8	17	5	5	10	0.04
61-70	12	2	14	5	2	7	0.03
71-80	2	1	3	0	0	0	0.05

RESULT: PATIENT'S AGE HIGHER THAN 50 YEARS CORRELATES WITH INCREASED RISK OF MORTALITY

DIAGNOSIS

S.no	Diagnosis	Male	Female	Total	Death	Male death	Female death	P value
1	HOLLOW VISCUS PERFORATION	12	2	14	6	5	1	0.04
2	BOWEL GANGRENE	6	1	7	4	3	1	0.03
3	OBST. ING HERNIA	2	0	2	0	0	0	0.29
4	OBST. VENTRAL HERNIA	1	2	3	0	0	0	0.24
5	DFS	0	2	2	2	0	2	0.08
6	ACUTE LIMB ISCHEMIA	1	0	1	1	1	0	0.36
7	MALIGNANCY	2	4	6	3	0	3	0.06
8	FOURNIER	1	0	1	0	0	0	0.31
9	BOWEL STRICTURE	2	0	2	1	1	0	0.24
10	EC FISTULA	2	0	2	0	0	0	0.19
11	LIVER ABSCESS	1	0	1	0	0	0	0.07
12	ING HERNIA	1	0	1	0	0	0	0.07
13	INT OB	2	2	4	0	0	0	0.08
14	PERIANAL ABSCESS	1	0	1	1	1	0	0.09
15	SIGMOID VOLVULUS	1	0	1	1	1	0	0.07
16	INTRAPERITONEAL ABSCESS	0	1	1	0	0	0	0.06
17	CARBUNCLE	1	0	1	1	1	0	0.07

RESULT: CONDITIONS THAT CAUSE SEPTICEMIA SUCH AS HOLLOW VISCUS PERFORATION, BOWEL GANGRENE ARE ASSOCIATED WITH INCREASED RISK OF DEATH

PROCEDURE

S. no	Procedure	Male	Female	Total	Male death	Female death	Total death	P value
1	EMERGENCY	31	11	42	13	6	19	0.04
2	ELECTIVE	5	3	8	0	1	1	0.21

RESULT: Emergency surgery which requires mechanical ventilation has a higher risk of mortality

RISK FACTORS

S.NO	RISK FACTOR	MALE	FEMALE	TOTAL	MALE DEATH	FEMALE DEATH	P VALUE
1	ALCOHOL	3	0	3	0	0	0.07
2	SMOKING	7	0	7	0	0	0.06
3	ALCOHOL SMOKING	21	0	21	10	0	0.04
4	NIL	5	14	19	3	7	0.21

RESULT: Combined risk factor of alcohol and smoking has a high risk of mortality.

COMORBID ILLNESS

S.NO	RISK FACTOR	MALE	FEMALE	TOTAL	DEATH	MALE DEATH	FEMALE DEATH	P VALUE
1	DM	5	2	7	2	1	1	0.040
2	HT	1	2	3	2	0	2	0.071
3	DM & HT	5	1	6	4	3	1	0.038
4	DM HT CAD CKD	1	0	1	1	1	0	0.031
5	DM HT CAD	1	0	1	1	1	0	0.030
6	TAO	2	0	2	1	1	0	0.101
7	TB	1	0	1	1	1	0	0.046
8	NIL COMORBID	20	9	29	8	5	3	0.124

RESULT: Presence of diabetes mellitus, combined DM, HT, CAD and CKD and pulmonary tuberculosis is associated with poor prognosis as evidenced by increased rate of deaths.

TYPE OF VENTILATION

S.NO	VENTILATION MODE	MALE	FEMALE	TOTAL	MALE DEATH	FEMALE DEATH	P VALUE
1	ACMV	24	10	34	13	7	0.054
2	SIMV	12	4	16	0	0	0.089

RESULT: Type of ventilation has no significant effect on mortality rates

S.NO	DURATION OF SURGERY	MALE	FEMALE	TOTAL	MALE DEATH	FEMALE DEATH	P VALUE
1	LESS 2 HR	8	3	11	2	2	0.087
2	2-4 HRS	20	6	26	9	3	0.068
3	> 4 HRS	8	5	13	2	2	0.047

RESULT: Prolonged surgery greater than 4 hours is associated with increased case fatality rates

S.NO	SURGERY	MALE	FEMALE	TOTAL	MALE DEATH	FEMALE DEATH	P VALUE
1	ABDOMEN	27	11	38	10	5	0.061
2	VASCULAR	1	0	1	1	0	0.087
3	HEAD& NECK	2	1	3	0	0	0.092
4	DEBRIDEMENT(Soft tissue of lower lims)	3	2	5	2	2	0.074
5	HERNIA	3	0	3	0	0	0.101

RESULT: Surgical procedure does not have a significant bearing on the mortality rates

S.no	Duration of weaning	Male	Female	Total	Male death	Female death	P value
1	<12 HRS	5	1	6	0	0	0.097
2	12-24 HRS	13	3	16	0	0	0.074
3	>24-36 HRS	2	1	3	0	0	0.057
4	> 36 HRS	4	1	5	0	0	0.043
5	NOT WEANED AT ALL	12	8	20	13	7	0.027

RESULT: Time interval from surgical procedure to weaning more than 36 hours is associated with increased mortality.

S.NO	CAUSES	MALE	FEMALE	TOTAL	MALE DEATH	FEMALE DEATH	P VALUE
1	METABOLIC ACIDOSIS	4	1	5	1	0	0.048
2	MET ACIDOSIS/ HYPOTENSION	11	2	13	6	2	0.039
3	HYPOTENSION	8	4	12	5	2	0.045
4	PROLONGED SURGERY	2	3	5	0	1	0.048
5	PRS	7	3	10	1	1	0.043
6	EPOV	4	1	5	0	1	0.061

RESULT: Non extubation causes like metabolic acidosis, hypotension, prolonged surgery and poor respiratory effort are associated with increased death rates

S.NO	COMPLICATIONS	MALE	FEMALE	TOTAL	MALE DEATH	FEMALE DEATH	P VALUE
1	AKI	2	3	5	2	3	0.057
2	PLEURAL EFFUSION	3	0	3	3	0	0.064
3	AKI & PE	1	0	1	0	1	0.043
4	DKA	1	1	2	1	1	0.039
5	SSI	5	2	7	0	0	0.060
6	DVT	2	0	2	2	0	0.058
7	PNEUMONIA	2	1	3	2	0	0.047
8	WOUND DEHISENCE	3	0	3	0	0	0.056
9	SEROMA	1	0	1	0	0	0.087
10	FLAP NECROSIS	1	0	1	0	0	0.064

RESULT: Complications such as AKI, pleural effusion, pneumonia, DKA and pulmonary embolism are associated with increased mortality.

S.no	Intervention	Male	Female	Total	Male death	Female death	P value
1	HEMODIALYSIS	2	4	6	2	4	0.047
2	SECONDARY SUTURING	1	0	1	0	O	0.069

RESULT: Interventional procedures such as hemodialysis correlates with increased mortality.

S.no	Cause of death	Male	Female	Total	Percentage
1	SEPTICEMIA	8	4	12	24%
2	SEPTIC SHOCK	2	0	2	4%
3	PC & APE	1	0	1	2%
4	AOCKD& PE	1	0	1	2%
5	MET & HT&AKI	0	2	2	4%
6	PERSISTENT HYPOTENSION	0	1	1	2%
7	AKI & HYPOTENSION	1	0	1	2%

DISCUSSION

- Patients on mechanical ventilation both during intra and post-operative period have various risks and outcomes which depends on a constellation of factors that are discussed in our study.
- This observational (prospective) study was conducted in Rajiv Gandhi Government General Hospital, Chennai over a period of nine months to elucidate the various factors influencing outcome in patients on post- operative mechanical ventilation.
- A total of fifty patients were studied which included in our study with age distribution ranging from 21 to 78 years, with 5(10%) of age group 21 – 30 years, 5(10.1%) of age group 31 – 40 years, 6(12%) of age group 41 – 50 years, 17(34%) of age group 51 – 60 years, 14(28) of age group 61-70 and 3(6%) of age group 71-80 with a mean ± S.D of 49.5 ± 14 years .
- The sex distribution pattern in our study included 36(72%) males and 14 (28%) females.
- Various factors such as risk factors, comorbid illness, diagnosis, indication of surgery whether elective or emergency, duration of surgery, type of surgery, causes for non extubation, duration of weaning period, mode of ventilation, post-op complications and interventions were studied .

- The correlation between various factors influencing mortality were calculated using appropriate statistical tests if significance
- The different factors that correlated with increased risk of mortality include
  - Patient's age >50 years (P=0.04)
  - Conditions that cause septicemia such as hollow viscus perforation and bowel gangrene (P=0.03)
  - Emergency surgery (P=0.04 vs P=0.21 in elective surgery)
  - Risk factors such as smoking and alcohol combined when compared with individual risk factors (P=0.04 vs P=0.07)
  - Co morbid illness such as diabetes mellitus, systemic hypertension, coronary artery disease and chronic kidney disease combined when compared with those patients with nil comorbid illness(P=0.031 vs P=0.124)
  - Prolonged intra operative course, i.e. more than 4 hours when compared with surgery less than 2 hrs (P=0..47 vs P=0.087)
  - Increased duration of patients on ventilator upto the time of weaning, i.e. more than 36 hours (P=0.043 vs P=0.097)
  - Metabolic acidosis and hypotension requiring inotropic support (P=0.039)
  - New onset post-op complications like acute kidney injury, pulmonary embolism and diabetic ketoacidosis (P=0.039)

- The factors which did not have a bearing on the mortality of the patient include
  - Mode of ventilation such as ACMV and SIMV(P=0.054 and 0.089)
  - Compartmental classification of surgical procedure such as abdomen, head and neck, soft tissue of lower limbs,etc (P=0.061, 0.092, 0.094).
- The various cause of death include septicemia (24%), septic shock (4%), Pneumonic consolidation and acute pulmonary embolism (2%), acute exacerbation of chronic kidney disease (2%), metabolic acidosis (4%), persistent hypotension (2%), combined acute kidney injury with persistent hypotension(2%)

CONCLUSION

Management of mechanical ventilated post-operative patients in Intensive Surgical Care Unit mandates an inter-departmental disciplinary approach by surgeon, anesthetist and paramedical team. Various factors like respiratory, surgical and other hemodynamic factors play an important role in the outcome of mechanically ventilated patients (ISCU).This study reveals the various causes that play a cognitive role in deciding the prognosis of a patient in mechanical ventilator and also the important areas that require careful attention.

Septicemia, being the major cause of death, this factor needs extra attention ranging from optimum pre-operative stabilisation, prophylactic pre-op or post-operative antibiotic coverage. Early identification of complications such as ventilator associated pneumonia, adult respiratory distress syndrome, metabolic acidosis and its appropriate management play a vital role in reducing the case fatality. This study also stresses the need to reduce the use of ventilator in the post-operative period and timely assessment and management of mechanical ventilated patients and to identify the effects of surgical factors in determining the outcome of mechanical ventilated patients, which will in turn help in the planning of proper management.

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MASTER CHART

S no	IP no	Age	Sex	Diagnosis	Emergency	Elective	Comorbid	Risk factors	Procedure	Surgery duration	Mode of ventilation	Cause for Non extubation	Type of anesthesia	Duration of weaning	Cause of death	Discharge	Complication	Intervention
1	39448	65	M	PERF.	Y	N	N	S	I	2.15	AC	ACID	GA	20	-	Y	SSI	-
2	27718	64	M	CA	N	Y	-	S	CR	5.30	SC	PROL	GA	18	-	Y	FN	-
3																		
4																		
5																		
6																		
7																		
8																		
9																		
10																		

<u>ஆய்வு ஒப்புதல் படிவம்</u>

ஆய்வின் தலைப்பு

சென்னை ராஜீவ் காந்தி அரசு பொது மருத்துவமனையில் அறுவை சிகிச்சை செறிவுக்கவனிப்புப் பிரிவில் இயந்திர சுவாச கருவியின் மூலம் சிகிச்சை பெறும் அறுவை சிகிச்சை மேற்கொண்ட நோயாளிகளின் சிகிச்சை முடிவு மற்றும் விளைவுகளைப்பற்றிய ஆய்வு

ஆய்வு நிலையம் : பொது அறுவை சிகிச்சைத்துறை, ராஜீவ் காந்தி அரசு பொது மருத்துவமனை, சென்னை மருத்துவக் கல்லூரி சென்னை – 3.

பங்கு பெறுவரின் பெயர் :

பங்குபெறுபவரின் எண் :

பங்குபெறுபவர் இதனை (✓) குறிக்கவும்

..... என்பவராகிய நான் இந்த ஆய்வின் விவரங்களும் அதன் நோக்கங்களும் முழுமையாக அறிந்துகொண்டேன். எனது சந்தேகங்கள் அனைத்திற்கும் தகுந்த விளக்கம் அளிக்கப்பட்டது. இந்த ஆய்வில் முழு சுதந்திரத்துடன் மற்றும் சுய நினைவுடன் பங்குகொள்ள சம்மதிக்கிறேன். ☐

எனக்கு விளக்கப்பட்ட விஷயங்களை நான் புரிந்துகொண்டு நான் எனது சம்மதத்தை தெரிவிக்கிறேன். இச்சுய ஒப்புதல் படிவத்தை பற்றி எனக்கு விளக்கப்பட்டது. ☐

இந்த ஆய்வினை பற்றிய அனைத்து தகவல்களும் எனக்கு தெரிவிக்கப்பட்டது. இந்த ஆய்வில் எனது உரிமை மற்றும் பங்கினை பற்றி அறிந்துகொண்டேன். ☐

இந்த ஆய்வில் பிறரின் நிர்பந்தமின்றி என் சொந்த விருப்பத்தின்பேரில் தான் பங்கு பெறுகிறேன் மற்றும் நான் இந்த ஆராய்ச்சியிலிருந்து எந்நேரமும் பின்வாங்கலாம் என்பதையும் அதனால் எந்த பாதிப்பும் ஏற்படாது என்பதையும் நான் புரிந்துகொண்டேன். ☐

இந்த ஆய்வில் கலந்துகொள்வதன் மூலம் என்னிடம் பெறப்படும் தகவலை ஆய்வாளர் இன்ஸ்டிட்யூசனல் எத்திக்ஸ் கமிட்டியினரிடமோ, அரசு நிறுவனத்திடமோ தேவைப்பட்டால் பகிர்ந்துகொள்ளலாம் என சம்மதிக்கிறேன். ☐

இந்த ஆய்வின் முடிவுகளை வெளியிடும்போது எனது பெயரையோ, அடையாளங்களையோ வெளியிடப்படாது என அறிந்துகொண்டேன். இந்த ஆய்வின் விவரங்களைக் கொண்ட தகவல் தாளைப் பெற்றுக்கொண்டேன். இந்த ஆய்விற்காக இரத்தப் பரிசோதனை செய்துகொள்ள சம்மதிக்கிறேன். ☐

இந்த ஆய்வில் பங்கேற்கும் பொழுது ஏதேனும் சந்தேகம் ஏற்பட்டால், உடனே ஆய்வாளரை தொடர்புகொள்ள வேண்டும் என அறிந்துகொண்டேன். ☐

இந்த ஆய்வில் எனக்கு மருத்துவ பரிசோதனை, இரத்தப் பரிசோதனை செய்துகொள்ள முழு மனதுடன் சம்மதிக்கிறேன். ☐

இச்சுய ஒப்புதல் படிவத்தில் கையெழுத்திடுவதன் மூலம் இதிலுள்ள அனைத்து விஷயங்களும் எனக்கு தெளிவாக விளக்கப்பட்டது என்று தெரிவிக்கிறேன். இச்சுய ஒப்புதல் படிவத்தின் ஒரு நகல் எனக்கு கொடுக்கப்படும் என்று தெரிந்துகொண்டேன். ☐

பங்கேற்பாளர்/ பாதுகாவலர் கையொப்பம் தேதி:

ஆய்வாளர் கையொப்பம் தேதி:

ஆராய்ச்சி தகவல் தாள்

சென்னை ராஜீவ் காந்தி அரசு பொது மருத்துவமனையில் அறுவை சிகிச்சை செறிவுக்கவனிப்புப் பிரிவில் இயந்திர சுவாச கருவியின் மூலம் சிகிச்சை பெறும் அறுவை சிகிச்சை மேற்கொண்ட நோயாளிகளின் சிகிச்சை முடிவு மற்றும் விளைவுகளைப்பற்றிய ஆய்வு நடைபெறுகிறது.

அறுவை சிகிச்சையின்போது மயக்க மருந்து கொடுத்து இயந்திர சுவாசக் கருவியினால் செயற்கை சுவாசம் கொடுக்கப்பட்டு அறுவை சிகிச்சை செய்யப்படுகிறது. இவ்வாறு அறுவை சிகிச்சை பெறும் நோயாளிகள் அறுவை சிகிச்சைக்குப்பின்னர் இயந்திர சுவாசக்கருவியிலேயே இருக்கும் நிலை ஏற்படுகிறது. இதற்கு பல முன் காரணிகள் உள்ளன.

நீங்களும் இந்த ஆராய்ச்சியில் பங்கேற்க நாங்கள் விரும்புகிறோம். அதனால் தங்களது நோயின் ஆய்வறிக்கையோ அல்லது சிகிச்சையோ பாதிப்பு ஏற்படாது என்பதையும் தெரிவித்துக்கொள்கிறோம்.

முடிவுகளை அல்லது கருத்துக்களை வெளியிடும்போதோ அல்லது ஆராய்ச்சியின்போதோ தங்களது பெயரையோ அல்லது அடையாளங்களையோ வெளியிட மாட்டோம் என்பதை தெரிவித்துக்கொள்கிறோம்.

இந்த ஆராய்ச்சியில் பங்கேற்பது தங்களுடைய விருப்பத்தின்பேரில்தான் இருக்கிறது. மேலும் நீங்கள் எந்த நேரமும் இந்த ஆராய்ச்சியிலிருந்து பின்வாங்கலாம் என்பதையும் தெரிவித்துக்கொள்கிறோம்.

இந்த சிறப்பு பரிசோதனைகளின் முடிவுகளையும் நோயின் தன்மை பற்றியும் ஆராய்ச்சியின்போது அல்லது ஆராய்ச்சியின் முடிவின்போது தங்களுக்கு அறிவிப்போம் என்பதையும் தெரிவித்துக்கொள்கிறோம்.

ஆராய்ச்சியாளர் கையொப்பம் **பங்கேற்பாளர் கையொப்பம்**

நாள் :
இடம் :

MASTER CHART

S no	IP no	Age	Sex	Diagnosis	Emergency	Elective	Comorbid	Risk factors	Procedure	Surgery duration	Mode of ventilation	Cause for Non extubation	Type of anesthesia	Duration of weaning	Cause of death	Discharge	Complication	Intervention
1	39448	65	M	PERF.	Y	N	N	S	I	2.15	AC	ACID	GA	20	-	Y	SSI	-
2	27718	64	M	CA	N	Y	-	S	CR	5.30	SC	PROL	GA	18	-	Y	FN	-
3	40258	58	M	PA	Y	N	DM,HT	S,AL,	DEB	1	AC	A/H	SA	1	SEPT	-	-	-
4	41338	29	M	PERF	Y	N	-	ALC	OPC	1.30	AC	HYPO	GA	16	-	Y	-	-
5	40823	57	F	DFS	Y	N	HT	-	WD	1	AC	A/H	GA	-	SEPT		AKI	HD
6	36062	60	M	PERF	Y	N	DM	ALC	ILE	2.15	AC	PRS	GA	20	-	Y	SSI	-
7	42824	65	M	GANG	Y	N	DM,HT,CAD	-	HEMI	4.15	AC	A/H	GA	-	SS	-	AKI	HD
8	43253	60	M	VOL	Y	N	-	S/ALC	IL	4.05	AC	H	GA	-	APE	-	PN	-
9	45112	60	F	GANG	Y	N	-	-	IL	4.30	AC	PROL	GA	-	SEPT	-	AKI	HD
10	45167	70	M	OIH	Y	N	-	S	IL	3.05	AC	PRS	GA	46	-	Y	WDE	-
11	46931	65	M	PERF	Y	N	TB	ALC/S	OPC	3.15	AC	PRS	GA	-	SEPT	-	PE	-
12	43145	62	M	CA	Y	N	DM	ALC/	LS	4.1	A	PROL	G	70	-	Y	-	-

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								S		5	C		A					
13	35018	55	F	CA	N	Y	-	-	CR	6.10	AC	PROL	GA	16	-	Y	-	-
14	47830	56	M	PERF	Y	N	-	S	APP	1.45	AC	PRS	GA	20	-	Y	SER	-
15	52139	45	M	STR	Y	N	-	S/ALC	IL	3.10	AC	H	GA	18	-	Y	-	-
16	52647	37	M	AMI	Y	N	-	S/ALC	BR	3.30	AC	ACID	GA	-	SS	-	DVT	-
17	45988	68	M	PERF	Y	N	DM/HT/CAD/CKD	-	CC	2.30	AC	H	GA	-	AOCKT/PE	-	AOCKD	HD
18	42254	38	F	CA	Y	N	-	-	TG	4.15	SC	PROL	GA	10	-	Y	-	-
19	53687	78	M	OIH	Y	N	-	S	HR	1.45	SC	PRS	GA	14	-	Y	SSI	-
20	54645	21	F	PERF	Y	N	-	-	OPC	3.00	SC	H	GA	10	-	Y	-	-
21	55000	56	M	SMV	Y	N	TAO-	S/ALC	TDR	4.00	AC	A/H	GA	-	BPS	-	PE	-
22	53373	45	M	PERF	Y	N	-	S/ALC	PC	2.15	AC	H	GA	-	SEPT	-	PC	-
23	55098	60	M	PERF	Y	N	-	S/ALC	TJ	4.10	AC	A/H	GA	26	-	Y	-	-
24	5789DM7	54	F	CA	Y	N	DM	-	LTC	3.30	AC	H	GA	-	MET/AKI	-	AKI	HD

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25	56280	22	F	IPA	Y	N	DM	-	NEC	3.00	AC	ACID	GA	46	-	Y	SSI	-
26	60141	74	F	OVH	Y	N	-	-	DR	3.00	AC	PRS	GA	28	-	Y	SSI	-
27	60491	47	M	PERF	Y	N	-	ALC	AGJ	4.30	AC	A/H	GA	46	-	Y	-	-
28	60851	50	M	AMI	Y	N	TAO	S/ALC	IL	3.30	AC	A/H	GA	26	-	Y	WDE	SS
29	60858	65	M	FG	Y	N	DM	S/ALC	DEB	1.00	SC	ACID	GA	14	-	Y	-	-
30	57829	45	M	RIH	N	Y	DM,HT	S	MES	1.45	SC	PRS	GA	10	-	Y	WDE	-
31	65976	25	M	AMI	Y	N	-	-	BR	3.15	SC	A/H	GA	22	-	Y	-	-
32	66811	55	M	MC	Y	N	DM,HT	S/ALC	WD	1.45	AC	A/H	GA	-	SEPT	-	DKA	-
33	67625	75	M	CA	Y	N	DM	S/ALC	JY	3.30	AC	PRS	GA	46	-	Y	-	-
34	68050	67	M	PERF	Y	N	DM	S/ALC	LI	3.00	AC	A/H	GA	-	SEPT	-	-	-
35	68981	67	M	OVH	Y	N	-	-	AR	1.50	SC	EOPV	GA	20	-	Y	-	-
36	62908	32	M	CA	N	Y	HT	S	CR	5.15	SC	EOPV	GA	8	-	Y	-	-
37	69220	65	M	AMI	Y	N	DM,HT	S/AL	TC	4.0	A	A/H	G	22	-	Y	-	-

S no	IP no	Age	Sex	Diagnosis	Emergency	Elective	Comorbid	Risk factors	Procedure	Surgery duration	Mode of ventilation	Cause for Non extubation	Type of anesthesia	Duration of weaning	Cause of death	Discharge	Complication	Intervention
								C		0	C		A					
38	72192	34	M	ALI	Y	N	-	S/AL C	TRE	4.0 0	A C	H	G A	-	ARS/HT	-	DVT	-
39	67891	28	M	AL	N	Y	-	S/AL C	IL	3.1 5	SC	EOPV	G A	14	-	Y	SSI	-
40	71489	45	M	SA	N	Y	-	S/AL C	MAS	2.1 0	SC	EOPV	G A	10	-	Y	-	-
41	75331	60	F	OVH	Y	N	-	-	AR	1.4 5	SC	PRS	G A	16	-	Y	PN	-
42	72855	60	F	CA	Y	N	-	-	JY	3.4 5	A C	H	G A	-	METS/AR F	-	AKF	H D
43	77084	65	F	PERF	Y	N	-	-	OPC	2.4 5	A C	PRS	G A	-	SEPT	-	-	-
44	81116	60	M	RLA	Y	N	-	S/AL C	LAV	3.0 0	SC	ACID	G A	10	-	Y	-	-
45	81162	35	M	ECF	Y	N	-	-	TD	4.1 5	A C	H	G A	16	-	Y	-	-
46	82401	68	F	CA	Y	N	HT	-	WHI	4.1 0	A C	EPOV	G A	-	PHT	-	-	-
47	85947	67	M	PERF	Y	N	DM,HT	S/AL C	OPC	2.3 0	A C	A/H	G A	-	SEPT	-	-	-
48	87515	55	M	STR	Y	N	-	S/AL C	BR	3.4 0	A C	H	G A	-	SEPT	-	PE	-
49	56254	56	F	CELL	Y	N	DM,HT	-	DEB	1.5 0	A C	A/H	G A	-	SEPT	-	DKA	-

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50	57451	56	F	CA	N	Y	-	-	TRI	4.50	AC	H	GA	22	-	Y	SSI	-

Explanation

PERF : Hollowviscus Perforation, CA : Carcinoma, PA : Perianal Abscess, DFS : Diabetic Foot syndrome, GANG : Gangrene, VOL : Volvulus,
OIH : Obstructedinguinal Hernia, STR : Bowel Stricture, AMI : Acutemesenteric Ischaemia, SMV : Superior mesenteric Vein Ischaemia,
IPA : Intra Peritoneal Abscess, OVH : Obstructed Ventral Hernia, FG : Fournier Gangrene, MC : Multiple Carbuncle, ALI : Acute Limb Ischaemia,
AL : Anastomotic Leak, SA : Scrotal Abdomen, RLA : Ruptured Liver Abscess, ECF : Entero Cutaneous Fistula, CELL : Cellulits, M : Male, F : Female,
DM : Diabetis Mellitus, HT : Hyper Tension, N : Nil, Y : Yes, S : Smoking, ALC : Alcoholic, GA : General Ananesthesia, AC : Assisted Control Ventilation,
SC : Synchronised Control Ventilation, ACID : Acidosis, A/H : Acidosis / Hypo Tension, EPOV : Elective Post Operative Ventilation, PROL : Prolonged Surgery
PRS : Poor Respiratory Syndrome, SEPT : Septicemia, SS : Septic Shock, APE : Acute Pulmonary Edema, SER : Seroma, DVT : Deep Vein Thrombosis,
AOCKD : Acute on Chronic Syndrome, SSI : Skin Site Infection, PE : Pleural Effusion, PC : Pneumonic Consolidation, AKI : Acute Kidney Injury,
DKA : Diabetic Keto Acidosis, WDE : Wound Dehiscence, PN : Pneumonia, CR : Composite Resection, BR : Bowel Resection, DEB : Debridement,
OPC : Omental Patch Closure, WD : Wound Debridement, ILE : Ileostomy, HEMI : Hemicolectomy, LS : Loop Sigmoidectomy, APP : Appendicectomy,
CC : Chole Cystectomy, TG : Total Gastroctomy, HR : Hermia Repair, TDR : Tube Duodenostomy, TJ : Tube Jejunostomy, NEC : Necrosectomy,
AGJ : Anterior Gastro Jejunostomy, MES : Mesh Repair, JY : Jejunostomy, AR : Anatomy Repair, TRE : Transfemoral Embolectomy, MET : Metastasis,
LAV : Lavage, WHI : Whipple Procedure, TRI : Triple Byepass, HD : Hemo Dialysis,