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Factors Predisposing to Organ (s) Dysfunction among Critically Ill Adult Patients at a Selected University Hospital in Egypt

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Abstract
Multiple organs dysfunction is one of the most challenging clinical problems in the intensive care units. It is one of the leading causes of morbidity and the main cause of mortality in critically ill patients. Therefore, requires efforts of of the health care team especially critical care nurses who are the healthcare providers and most closely involved in the daily care of critically ill patients. They have the opportunity to early detect and identify patients at risk for the development organs dysfunction. **Aim of the study:** to identify factors predisposing to organ(s) dysfunction among critically ill adult patients at a selected university hospital. **Research questions:** Q1-What is the frequency of organ dysfunction among critically ill adult patients at a selected university hospital, in Egypt? Q2-What are diffrent predisposing factors to organ dysfunction among critically ill adult patients at a selected university hospital, in Egypt?. **Research design:** A descriptive/exploratory research design was utilized. **Sample:** A sample of convince consisting of 110 adult male and female critically ill patients admitted to to different intensive care units over a period of six months was included. **Tools of data collection: Four tools were utilized for data collection:** Sociodemographic and Medical data Sheet; Predisposing Factors to Organ (s) Dysfunction Assessment Sheet; Physical Assessment Sheet; and The Sequential Organ Failure Assessment score (SOFA). **Results:** The current study revealed that: more than half (55.5%) of the studied sample had two organs dysfunction, of these (n=33/54.1%) were in age group from 58 - < 68, with no significant statistical relationship between the age and frequency of organs dysfunction (χ2/P = 20.24/0.20). Infection, heart failure, hypertension, and diabetes were the common predisposing factors to organ(s) dysfunction in percentages of 63.6%, 30.2%, & 22% respectively. Mild degree of organs dysfunction were most frequently noticed on admission, after 24 and 96 hours of admission to the ICU with mean SOFA scores of 5.08 ± 1.601, 4.87± 1.86, & 5.00 ± 1.87 respectively. The mean total and subtotal SOFA scores didn't differ significantly in different assessment times (F / P= 1.29/0.35, 3.63/0.10, 2.69/0.72). The fate of the studied sample differed significantly in relation to the total mean SOFA scores (χ^2= 54.96, p= 0.000). **Conclusion:** multi-organ(s) dysfunction was evident among critically ill patients. The most common predisposing factors were comorbidity diseases, infection on admission, after 48 and 96 hours of admission, having different types of shock, and trauma. So, identification and management of these predisposing factors may decrease the complication and improve patients 'outcomes. **Recommendations:** Based on findings of the present study the following are recommended: strict application of universal precautions / infection control measures; prevention, and early detection of shock, sepsis, and so organ dysfunction; designing continuous practical educational programs about the application of the strict aseptic technique, the universal precautions and infection control for critical care nurses; Designing booklets and posters about early manifestation, predisposing factors, and importance of prevention of sepsis and organ dysfunction for critical care nurses; and utilization of SOFA scores in the management of patient with sepsis and organ dysfunction.
Key words: Predisposing factors, Organ(s) Dysfunction, Critically Ill Patients, Sepsis, SOFA scores.

1. Introduction

Multiple organs dysfunction (MOD) is a clinical syndrome in which development of progressive and potentially reversible physiological dysfunction in two or more organs or organ systems are induced by a variety of acute insults including sepsis (Wick, 2012). MOD is a continuum of alteration in organ function that can vary widely from mild degree of organ dysfunction to sever organ failure. Patients with two or more organ systems involved have a mortality rate of approximately 75%, and patients with four organ systems involved have a 100% mortality rate (Sharma 2009).

Sepsis is one of the precipitating factors to MOD, in addition to numerous other causes of tissue damage such as trauma, burns, pancreatitis, dead or injured tissue and perfusion deficits, advanced age, and malnutrition. As well, acute and chronic illnesses, hypersensitivity to antigens, genetic predisposition for altered immune function may result in development of organs dysfunction. Patients may develop organs dysfunction as a consequence of primary infection or following nosocomial infections. Traumatic incident that requires surgery, blood transfusion, and other invasive measures may also place the patient at risk for infection, sepsis, and secondary organs dysfunction (Arthur, Baue, Faist, & Donald, 2009).

The incidence of sepsis is increasing in hospitalized patients and it is a major cause of morbidity and mortality. As indicated by Smeltzer & Bare (2010) systemic inflammatory response syndrome (SIRS) occurs in up to 80% of critically ill patients and up to 30% will progress to sepsis. A further 10-15% will develop severe sepsis and multiple organs dysfunction syndrome (MODS). The overall mortality from sepsis ranges from around 20 % and up to 40-60% for patients with septic shock. The rapid evolution of sepsis to the stage of septic shock represents a challenge to the acute hospital team (Schlag, Redl & Traber, 2012). As well, mortality from sepsis and MODS results from specific major organ failure, and no organ is immune from the ravages of the inflammatory processes of sepsis. Death rates increase with the increased number of failed organs, and so the increased costs of care (Micheletti & Lorraine, 2011). Across the world, the frequency of MODS is remarkably similar and ranges from 7% in victims of multiple traumas to 11% in the general ICU population (Marik, 2010). As revealed from the statistics and medical records department at Cairo University Hospitals (2010), the percentage of death among patients diagnosed with septicemia was 74% during the year 2009 as compared to 62% during the year 2006.

Because the critical care nurses are the healthcare providers who are most closely involved in the daily care of critically ill patients, they have the opportunity to identify patients with sepsis, prevent and early detect MODS. Identification of patients at risk for MODS requires awareness of complications related to the initial insult. Patients at risk for systemic inflammation should be continuously assessed for organ dysfunction (Turner, Moore & Todd, 2011). Comprehensive assessment and monitoring of patients at risk for, and who actually developed sepsis, and observation of the effects of treatment are key components of nursing care (Reinhart & Eyrich, 2012). This in addition to taking many actions, of these is utilization of sepsis resuscitation bundle that should be implemented over the first 6 hours after recognition of a patient with severe sepsis, and the sepsis management bundle that should be carried out over the first 24 hours of admission to the hospital (Silverman etal, 2011). Moreover, preventive measures include a multitude of assessment strategies to detect early organ manifestations of this syndrome.

Therefore, the current study is expected to provide data about predisposing factors to organ(s) dysfunction among adult critically ill patients. It could help in the construction of evidence based data about this problem that can be used by health professionals in the future plan of care for such group of patients. Also, it could help patients in receiving early and proper treatment and interventions which contribute to decreasing: mortality rates; incidence of complications; the burden upon health care resources, and improving the rate of turnover; and providing a cost effective health care. Moreover, it might generate an attention and motivation for further researches into this area.

2. Subjects and Method

2.1. Aim of the study: to identify factors predisposing to organ (s) dysfunction among critically ill adult patients at a selected university hospital, in Egypt.

2.2. Research design: A descriptive exploratory research design was utilized in the current study.

2.3. Research questions: To fulfill the aim of this study, the following two research questions were formulated:

Q1-What is the frequency of organ dysfunction among critically ill adult patients at a selected University Hospital in Egypt?

Q2-What are different predisposing factors to organ dysfunction among critically ill adult patients at a selected University Hospital in Egypt?

2.4. Setting: The current study was conducted at different intensive care units at Cairo University Hospitals.

2.5. Sample: A sample of convenience including 110 adult male and female patients who admitted to intensive care units over a period of six months (from May 2011 to October 2011) was included, with the following **inclusion criteria:** age ranged between 18 - < 65 years, both sex, having two or more organ dysfunctions. **Exclusion criteria:** Patients with malignancy, autoimmune disease & patients receiving immunosuppressive drug.

2.6. Tools of data collection: Four tools were utilized to collect data pertinent to the current study. Of these three tools were developed by the investigators: Socio-demographic and medical data sheet, physical assessment sheet, and predisposing factors to organ(s) dysfunction assessment sheet. However, the fourth tool (sequential organ failure assessments score sheet /SOFA) was adopted from Vincent, etal.,(1996).

2.6.1. Socio-demographic and medical data sheet: covers data related to patient's age, sex, level of education, occupation, marital status, place of residence, past medical history, smoking habits, date of admission, date of discharge, length of hospital stay, and main reasons of admission,……etc.

2.6.2. Physical assessment sheet: involves respiratory, cardiovascular, gastrointestinal, skin, and hematological assessment (blood glucose, liver function, kidney function, and serum electrolytes).

2.6.3. Predisposing factors to organ(s) dysfunction assessment sheet: is divided into two main parts:

2.6.3.a. Comorbidity diseases, presence of infection, and assessment for development of nosocomial infection;

2.6.3.b. Criteria of organ dysfunction.
2.6.4. Sequential Organ Failure Assessments Score Sheet (SOFA): is a scoring system used to determine the extent of patients' organ function or rate of dysfunction during their stay in the intensive care unit. **Scoring system:** SOFA score is a likert scale ranging from (0- 4).The greater the score, the worse the condition. These scores were classified as: 0 – < 8 point (mild organ dysfunction); 8 – < 16 point (moderate organ dysfunction); and 16 – 24point (severe organ dysfunction).

3. Tools validity and reliability: Tools developed by the investigators (tool I, 2 & 3) were examined by a panel of five experts in the field of Critical Care Medicine, and Critical Care and Emergency Nursing to test their clarity and objectivity and to estimate the needed time for data collection and if they are suitable to achieve the aim of the study. As regards the SOFA score, it is a valid, reliable, and effective assessment tool for organ dysfunction/failure in critically ill patients. As revealed by Karati, Asadzandi, Tadrisi, & Ebadi (2011) the SOFA score intra class correlation coefficient (ICC) rate = 0.889, and the Kappa score level (cooperation of the tool's items for measuring what will be predicted) was 0.552 for the nervous system, 0.634 for the respiratory systems and more than 0.8 for other systems of the human body.

4. Pilot study: A pilot study was done on (15) patients to test clarity, applicability, and objectivity of the data collection tools, and to estimate the needed time to complete each tool. Based on findings of the pilot study, certain modification were done in the data collection tools, therefore, the pilot study sample was not included in the current study.

5. Protection of human rights: The current study was approved by human research, and ethical committees at the faculty of nursing – Cairo University. Official permissions to conduct the study were obtained from medical and nursing directors of ICUs. Written consents were obtained from patients (if conscious), and from the responsible family members (if the patients are unconscious) after informing them about the purpose and nature of the study. Concerning the SOFA score, an official agreement was obtained from the developer (Vincent, etal., 1996).

6. Procedure
Conduction of the current study started with extensive literature review, selection and preparation of the data collection tools and obtaining managerial agreements to carry out the study. Once official permission was granted, the implementation phase started. The investigators approached the responsible nursing supervisors as well as the responsible physicians to identify the number of newly admitted patients who were diagnosed as having multiple organs dysfunctions on daily basis. Then patients were selected considering the inclusion criteria.
Each patient was interviewed individually (if conscious), and full explanation of the purpose and nature of the study was done, then the researcher obtained written consents from the involved patients, or their responsible family members (in case of unconsciousness). The data collection tools were filled out by the investigators, and other needed data were collected from patients' files, within a period of 30-60 minutes for each patient.

7. Results
7.1. Figure (1) clarifies percentage distribution of the studied sample as regards to their age. It reveals that more than half (50.9%) of the studied sample age ranged from 58 - <68, with a mean of 56.21 + SD =10.47.
7.2. Figure (2) shows percentage distribution of the studied sample as regards to gender. It indicates that 51.8% of the studied sample was males.
7.3. Figure (3) shows percentage distribution of the studied sample as regards to smoking habit. It clarifies that the majority (75 %) of the studied sample was not smoker.
7.4. Figure (4) represents percentage distribution of the studied sample as regards to main reasons of admission to the ICU. It reveals that dyspnea and chest infection were the most common causes of ICUs admission among 25.3% of the studied sample.
7.5. Figure (5) shows percentage distribution of the studied sample as regards to length of ICU stay. It clarifies that, more than half (51.8%) of studied sample stayed less than 7 days in the ICU, with a mean length of stay = 8.86 ± SD = 3.87.
7.6. Figure (6) shows frequency of organs dysfunction among the studied sample. It clarifies that, out of the totally admitted patients to the Critical Care Units during the period of data collection (n=2315), 110 patients developed multiorgan dysfunction, representing a percentage of 4.8%.
7.7. Figure (7) shows percentage distribution of infection among the studied sample in different assessment times. It clarifies that infection was the dominant predisposing factor to organ dysfunction among more than two thirds (63.6%) of the studied sample on admission to the ICU. The percentage of infection increased to affect

67.2% after 48 hours of admission, and remained prevalent among 57.2% after 96 hours of admission to the ICU.

7.8 – 7.10. Figures (8, 9, and 10) show different types of infection experienced by the studied sample in different assessment times. They clarify that chest infection was the dominant type in different assessment times in percentages of 37.2%, 45.9%, and 39.6% respectively.

7.11. Figure (11) shows percentage distribution of the studied sample as regards to comorbidity diseases. It clarifies that heart failure, hypertension, and diabetes mellitus were other predisposing factors to organ dysfunction in percentages of 30.2% and 22%, respectively.

7.12. Table (1) clarifies degrees of organs dysfunction as estimated by SOFA scores. It shows that more than half (55.4% & 52.7% respectively) had mild organ dysfunction on admission and after 96 hours of admission. However, after 48 hours of admission, moderate to severe organ dysfunction were found among 30% & 25.4% of the studied sample. No significant statistical difference was found between the mean total and subtotal SOFA scores in different assessment times.

7.13. Table (2) shows relationship between total SOFA scores and fate of the studied sample. It indicates that, the great majority (93.2%) of those who had mild organs dysfunction remained alive. There was a high significant statistical difference between the total mean SOFA scores in relation to fate of the studied sample (χ^2= 54.96, p= 0.000).

7.14. Table (3) shows relationship between fate of the studied sample and frequency of organs dysfunction. It reveals that, among the majority (80%) of those who were alive, 55 patients (62%) had two organs dysfunction. A high significant statistical relationship was found between fate of the studied sample and frequency of organs dysfunction (χ^2/ P= 35.40/ 0.000).

8. Discussion

The current study revealed that the age of more than half of the studied sample ranged from 58 - < 68 years, with a mean of 56.21 + SD =10.47. This finding is in concordance with that of Freitas, Tereran, Assunção & Mirian (2009), who studied the impact of duration of organ dysfunction on the outcome of patients with severe sepsis and found that, the mean age was 55.6 years. Similarly, Pipatvech (2008), investigated predisposing factors to mortality in patients with sepsis, and indicated that the median age was 63 years old. In this regards, Arenal, etal (2008), analyzed morbid-mortality in patients with multiorgan dysfunction, and found that the mean age was 59 years.

Also, Hekmat, et al (2008) studied the daily assessment of organ dysfunction and survival rate in intensive care units, and found that the mean age was 65.4 years. Concerning gender, the current study demonstrates the dominance of males. This finding is in agreement with that of Arenal, etal (2008) and Pipatvech (2008) who reported the dominance of males among their studied sample. In addition, Bersten, Soni, & Eon (2009) studied using continuous renal replacement therapy to manage patients with shock and acute renal failure, and revealed that more than half of patients were males.

Unexpectedly, the present study reveals that, the majority of the studied sample was not smoker, and around one quarter was smoker. This finding was in agreement with that of Ferro, et al (2010), who studied smoking among trauma patients and its effects on the incidence of sepsis, respiratory failure, organ failure, and found that, more than half of the included patients was non smokers. Inspite of having about one quarter of the studied sample smokers, one cannot ignore the negative effect of smoking especially where there are strong evidences that support causal relationships between cigarette smoking and the development of bronchiolitis, and desquamative interstitial pneumonitis. In this regards, Oreskes & Conway (2010) indicted that, tobacco use leads most commonly to heart, liver and lungs diseases such as chronic obstructive pulmonary disease (including emphysema and chronic bronchitis), in addition to cerebrovascular stroke, and cancer.

As evident from the current study, cardiac diseases, shock, and respiratory diseases were the common diagnoses. This finding is in concordance with that of Flávio, et al (2009), who reported the prevalence of septic shock among more than two thirds of the studied sample. As well, Lundy, et al (2011) carried out a descriptive analysis of patients admitted to the intensive care units and revealed that cardiovascular diseases were the most common medical diagnosis requiring ICU admission. In this regards, Lockhart, Hamilton & Quinn (2009), indicted that, risk factors for cardiovascular disease mediate their effects by altering the structure and function of wall and endothelial components of arterial blood vessels. A pathological change in the microcirculation plays a pivotal role in promoting end-organ dysfunction that not only predisposes to further organ damage, but also increases the risk for future macro vascular events. Moreover, dyspnea and chest infection were the most common causes of admission to ICUs in the current study. In this regards, Vincent et al (2007) studied classification, incidence, and outcomes of sepsis and multiple organ failure, and indicted that sepsis affects about more than two thirds, and severe sepsis occurs in about one third of ICU admissions.

Regarding length of ICU stay, the current study showed that, more than half of the studied sample stayed less than seven days, with a mean of 8.86 ± SD= 3.87. This finding is in concordance with that found by Pipatvech (2008) who revealed that, the median length of hospital and ICU stay were six days. As well, Hekmat et al (2008) found a mean length of ICU stay of 7.2 days, and Arenal et al (2008) who reported a mean length of ICU stay of 9.7 days. In this regards, Williams, Finn, & Knuiman (2010) indicted that, critical illness leads to prolonged length of ICU stay, and is associated with significant mortality and resource utilization. It can adversely affect the health status by increasing the risk of infection, complications, and mortality.

The present study reveals that, during the period from May 2011 to December 2011, around 5% of the admitted patients had multiorgan dysfunction. Fortunately, this ratio is promising as compared to the international similar ratios which revealed that the prevalence of MODS ranges from 7-11 % in the ICU population. Regarding the number of organs dysfunction, more than half of the studied sample had two organs dysfunction. In this regards, Smeltzer & Bare (2010) described MODS as a sequential failure of two or more organ systems remote from the site of the original insult following injury, operation, or sepsis. Findings of the current study are similar to that of Arenal, etal (2008) who found organ failure among one half of the studied sample. As well, Saydain, etal (2002), studied the outcome of patients admitted to the ICU with pulmonary fibrosis, and found that, the majority developed one or more organ failure. As well, Wig, etal (2009), conducted a study about correlates of organ failure in severe acute pancreatitis, and reported that, one third of the studied sample developed two organs failure. Also, Shaheen & Akhtar (2007) studied organ failure associated with acute pancreatitis, and indicted that, the majority of patients had two organs failure. In addition, Wang, Xiao, Xiao & Xiu, (2010), studied prevalence and risk factors of organ failure in patients with severe acute pancreatitis, and found that the majority of patients had two organs failure. On the same line was Driscoll, etal (2010) who indicated that organ dysfunction is a common medical problem.

The most frequently associated comorbidities in the current study were heart failure; hypertension, and diabetes. In addition, infection was noticed on admission to the ICUs among more than two thirds of the studied sample. The proportion of those who had infection increased after 48 hours of admission as compared to the initial assessment and the last assessment time. Concerning type of infection, chest infection was the most dominant type in different assessment times. The increased proportion of those who had infection within 48 hours of admission could be due to hospital acquired infection which is also known as nosocomial infection. It is an infection that first appears between 48 hours and four days after admission to a hospital or other health-care facility as a result of invasion by bacteria, viruses, fungi, or parasites (Lessa, etal, 2012). In this regards Smith & Skola (2011) indicated that various infections play roles in occurrence of cancer, autoimmune disease, and chronic conditions. Infection and continuous inflammatory activation can cause damage to other organs, such as heart, lungs, kidneys, and other organs, and so multiple organs dysfunction.

As revealed from the current study, infection is a main predisposing factor to organ dysfunction, this is of special concern especially where the entire studied sample diagnosed as having MODS on admission which refers to their immune compromised state, and thus increased chances of acquiring more infection. This finding is in agreement with that of Koskela, etal (2009) who revealed that more than two thirds of patients developed multiple organ failure and the two most common causes of developing infections after 48 hours of admission were peritonitis and pneumonia. The proportion of those who had infection in the current study was reduced after 96 hours of admission the ICU to affect more than half of the studied sample. This from the investigators' point of view could be due to the administration of antibiotics and taking the necessary measures to limit the spread of infection. Findings of the current study are in agreement with that of Vincent (2011) who investigated the use of the SOFA score to assess the incidence of organ dysfunction/failure in the ICU, and revealed that approximately one third of patients had infection on admission. Also, Ulvik, Kvåle, Larsen & Flaatten (2007), studied multiple organ failure after trauma and reported that, MODS affected less than one third for trauma patients admitted to the ICU. Similary Vincent, etal (2007) reported that, sepsis affect more than one third of ICU admissions. As well, Blanco, Bombín & Sagredo (2008) studied incidence of organ dysfunction and mortality in severe sepsis, and found sepsis among more than half of the studied sample.

Concerning degree of organ dysfunction, the current study reveals that mild degree was most frequently noticed among more than two thirds of the studied sample during the initial assessment (within 24 hours from admission); after 48 hours from admission; and after 96 hours from admission, and fortunately they remained alive. Consistent with this finding was Arenal, etal (2008), who reported that the mortality rate in the ICU increased with the number of failing organs. Patients with four or more failing organs showed 90% mortality however, patients who developed complications had higher mortality rates. In addition Jop (2009) studied correlates of organ failure in severe acute pancreatitis, and found that mortality increased with an increasing number of organ failures. However, mortality was found by Sarkar, Dubois & Backer (2008) to occur irrespective of the number of failed organs and no significant relationship was noticed between the development of individual organ failure and mortality. Conversely, Lone & Walsh (2012) found strong association between

organ failure and mortality. They added that, patients surviving more than 12 months post-ICU discharge were more likely to subsequently die if they experienced greater organ failure burden in the ICU.

9. Conclusion: Based on findings of the current study, it can be concluded that, multiorgan(s) dysfunction is a common and serious problem among critically ill patients and affected (4.8%) of the total admitted ICU patients during a period of six months. Identification of predisposing factors to MODS may lead to better secondary prevention, especially where the most common predisposing factors were infection on admission, after 48hours, after 96hours, having different types of shock, sepsis, and trauma. So, identification and management of these predisposing factors may decrease complications and improve patients 'outcomes.

10. Recommendations: Based upon finings of the current study, the followings are recommended:

- Utilization of SOFA scores for the assessment of patient with sepsis and MODS.
- Utilizing the sepsis bundle in the management of patient with sepsis and MODS.
- Designing continuous practical educational programs about methods of utilizing strict aseptic technique, the universal precautions and infection control for health care providers especially the critical care nurses.
- Designing educational booklets and posters about early manifestation, predisposing factors, and importance of prevention of sepsis and MODS for critical care nurses to promote patients' care.

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Notes. List of figures and tables:

Figure (1): Percentage Distribution of the Studied Sample as Regards to Age Group (N= 110).

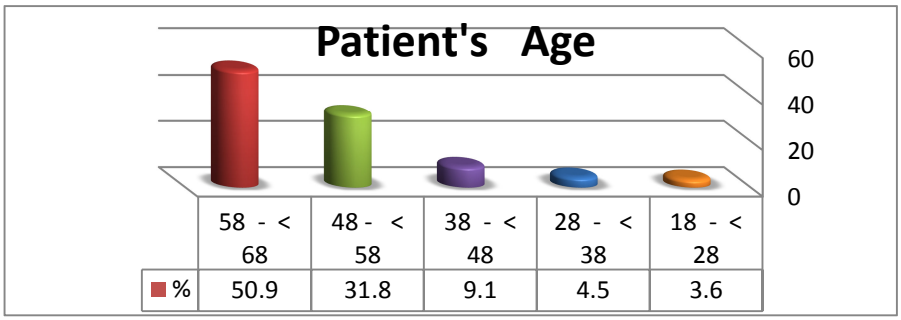


Figure (2): Percentage Distribution of the Studied Sample as Regards to Gender (N=110).

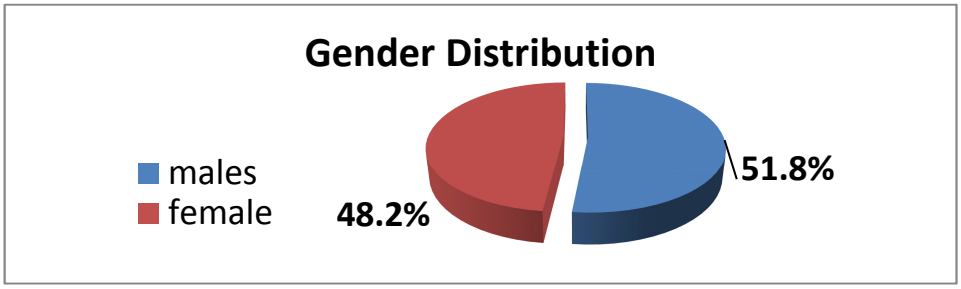


Figure (3): Percentage Distribution of the Studied Sample as Regards to Smoking Habit (N= 110).

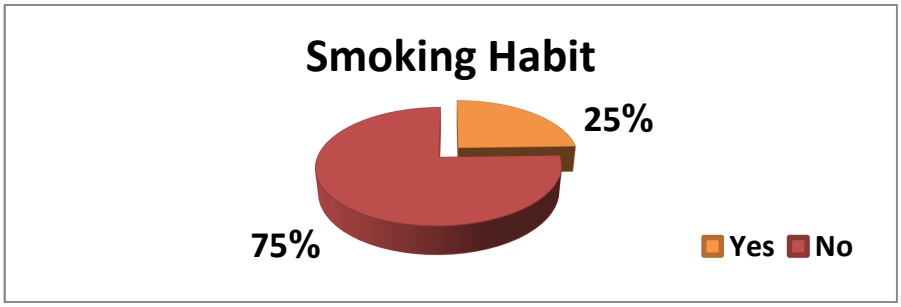
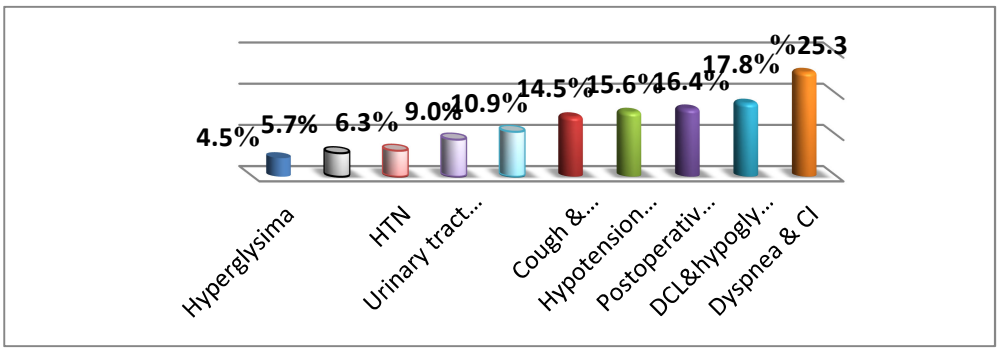


Figure (4): Percentage Distribution of the Studied Sample as Regards to Main Reasons of Admission to the ICU, (N=110).



NB - Responses are not mutually exclusive. HTN = Hypertension,
CI= Chest infection, S A = Syncopal attack DCL = Disturbed consciousness level,

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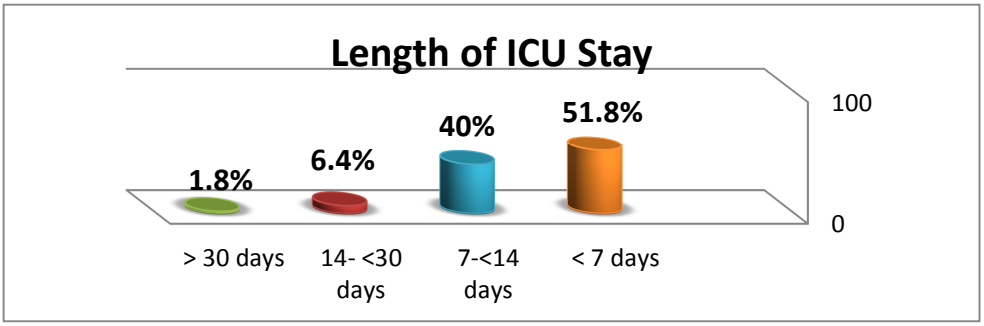
Figure (5): Percentage Distribution of the Studied Sample as Regards to Length of ICU Stay (N= 110).



*ICU= Intensive care unit

Figure (6): Frequency of Organs Dysfunction among the Studied Sample, (N=110).

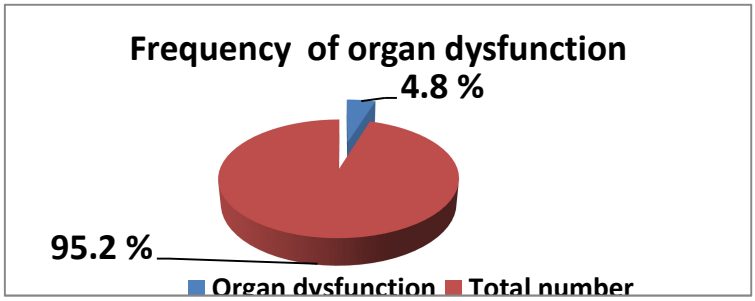
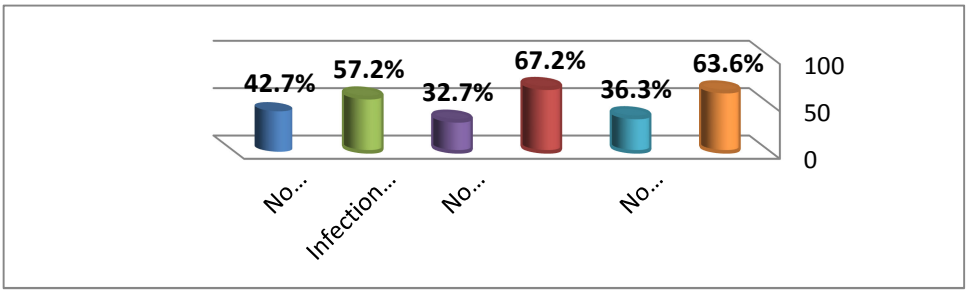
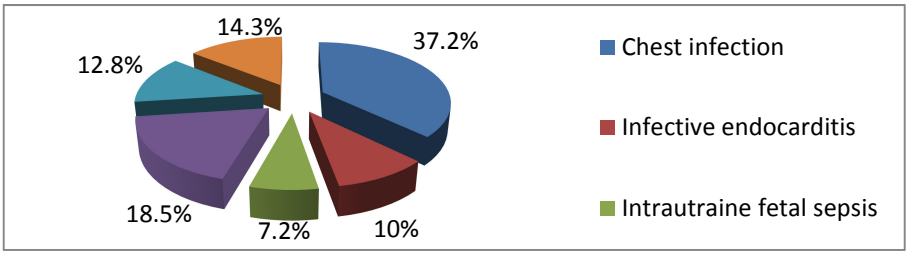


Figure (7): Percentage Distribution of Infection among the Studied Sample in Different Assessment Times (N=110).



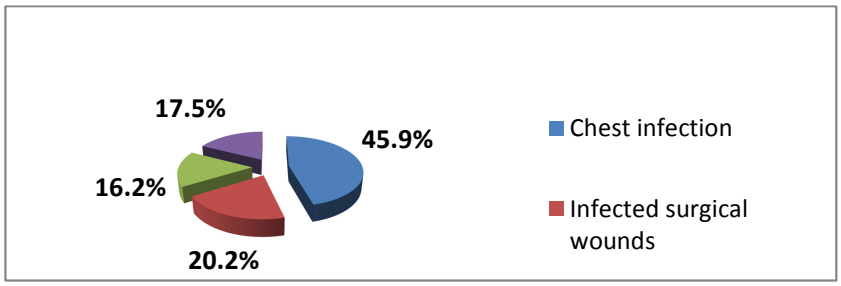
NB – Responses are not mutually exclusive.

Figure (8): Different Types of Infection Experienced by the Studied Sample on Admission (N=70).



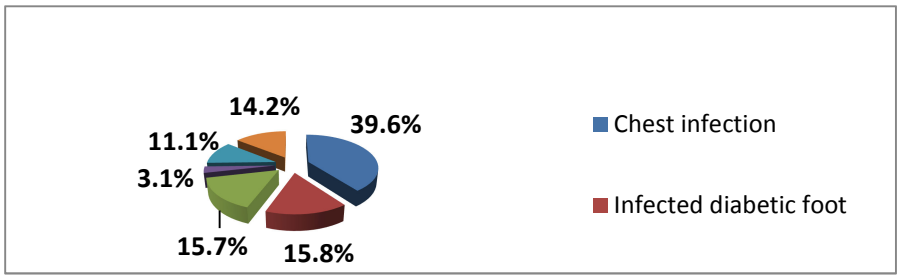
NB – Responses are not mutually exclusive.

Figure (9): Different Types of Infection Experienced by the Studied Sample after 48 hours of Admission (N=74).



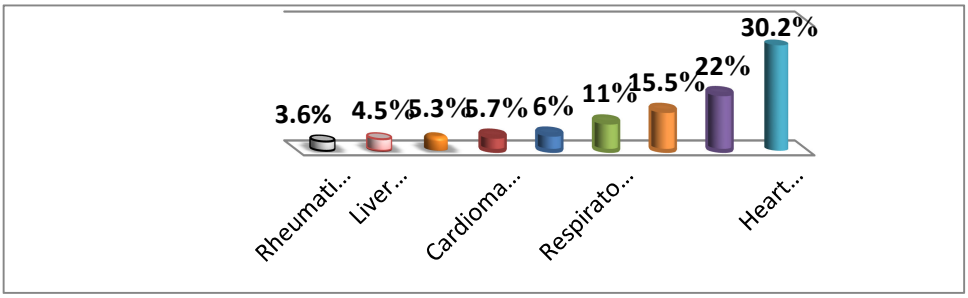
NB – Responses are not mutually exclusive.

Figure (10): Different Types of Infection Experienced by the Studied Sample after 96 hours of Admission (N=63).



NB – Responses are not mutually exclusive.

Figure (11): Percentage Distribution of the Studied Sample as Regards to Comorbidity Diseases (N=110).



NB - Responses are not mutually exclusive. *DM=Diabetes mellitu

Table (1): Degrees of Organs Dysfunction as Indicted by SOFA Scores among the Studied Sample, (N=110).

Time of assessment / Degree of organ dysfunction	Initial SOFA First 24 h of admission		After 48 h from admission		After 96 h from admission		F	P
	N	%	N	%	N	%		
Mild (0 – < 8 score)	61	55.4	49	44.5	58	52.7	1.29	
X ± SD	5.08± 1.601		4.87± 1.86		5.00±1.87			0.35 N.S
Moderate (8 –<16 score)	28	25.4	33	30	37	33.6	3.63	0.10 N.S
X ± SD	11.14 ±2.29		10.86 ±2.08		10.91±2.37			
Sever (16– 24 score)	21	19.0%	28	25.4	15	13.6	2.69	0.72 N.S
X ± SD	18.53±2.34		17.14±3.39		17.50±0.707			
	110	100	110	100	110	100		
Total	34.75+6.23		32.87+7.33		33.41+4.94			

* N.S= No significant statistic difference

Table (2): Relationship between Total SOFA Scores and Fate of the Studied Sample (N=110).

Total SOFA scores / Fate	**Total SOFA scores**								χ^2 / **P**
	Mild organs dysfunction (0-< 8) (n= 59)		**Moderate organs dysfunction (8- <16) (n=39)**		**Sever organs dysfunction (16- 24) (n=12)**		**Total (N=110)**		
	N	%	N	%	N	%	N	%	
Alive	55	93.2	33	84.6	0	0	88	80	54.96 / ***
Dead	4	6.8	6	15.4	12	100	22	20	0.000
Total	59	100	39	100	12	100	110	100	

***A high statistically significant at P < 0.05.

Table (3): Relationship between Fate of the Studied Sample and Frequency of Organs Dysfunction, (N=110).

Frequency of organs dysfunction / Fate	**Frequency of organs dysfunction**										**Total**		χ^2/ **P**
	Two organs (n=61)		**Three organs (n=29)**		**Four organs (n=13)**		**Five organs (n=3)**		**Six organs (n=4)**		**(N=110)**		
	N	%	N	%	N	%	N	%	N	%	N	%	
Alive	55	90.1	25	86.2	8	61.5	0	0.0	0	0.0	88	80.0	35.40 / ***
Dead	6	9.8	4	13.7	5	38.4	3	100	4	100	22	20.0	0.000
Total	61	100	29	100	13	100	3	100	4	100	110	100.0	

***A high statistically significant at P < 0.05