A retrospective Analysis of Annual Mortality in Rozhhalat Emergency Hospital Erbil- Iraq

Jwan Jimhur Hamza[1]*, Halgourd Fathulla Ahmed [2], Haval Faris Mohammed[3]

1. M.B.Ch.B , Emergency Medicine resident doctor, Rozhahlat Emergency Hospital, Hawler Medical University, Erbil-Kurdistan, Iraq. email: jwanjimhur86@gmail.com

2. M.B.Ch.B, FIBMS , Assistant Professor (Internal Medicine). Rozhhalat Emergency Hospital, Hawler Medical University , Erbil-Kurdistan, Iraq. fhalgurd@gmail.com

3. M.B.Ch.B; FKBMS-EM, Specialist in Emergency Medicine, Rozhhalat Emergency Hospital, Hawler Medical University , Erbil-Kurdistan, Iraq . havalfaris@gmail.com

*Corresponding Author

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ABSTRACT

Background: *Emergency medical care is fundamental in building and maintenance of effective national health system. Exploration of death causes is important specifically for preventable causes.*

Aim of study: *To detect the main causes of mortalities among patients admitted to Rozhhalat emergency hospital during one year duration.*

Patients & Methods: *A retrospective data review study conducted in Rozhhalat Emergency Hospital in Erbil city-Kurdistan through the period from 1st of January, to 31st of December, 2018 on sample of 204 patients died after admission to hospital. Diagnosis of death for selected patients was made officially by the senior on call at time of death depending on 10th International Classification of Diseases (ICD-10).*

Results: *Excluding traumatic cases, a total of 204 patients have died during the last year with age ranging from 8-92 years and average of 63.05 years, 56.9% of them were males and 43.1% were females. Common death causes for patients presented to Emergency hospital in last year were heart failure (22.8%), stroke (14.8%), myocardial infarction (12.8%), cancer (12.8%), septic shock (11.8%), brain hemorrhage (7.4%), renal failure (5%), etc. The common chief complaint of dead patients at presentation to ED was shortness of breath. There was a significant association between mortality diagnosis in and hospital departments (p=0.04).*

Conclusions: *Heart failure, stroke, myocardial infarction and cancer are the common death causes of patients presented to Rozhhalat emergency hospital in Erbil city after exclusion of trauma.*

Keywords: *Emergency Medical Care, Mortality, Causes, , Cardiovascular diseases, stroke, cancer*

1.INTRODUCTION

The emergency department (ED) is the frontline medical facility of the national health system reflects the quality of health care in each country [1]. The ED is commonly part of hospital or may be part of primary health care center1 and 30%-35% of patients admitted to hospitals were referred from emergency department [2]. The injuries represented top ten mortality causes globally and nationally in Kurdistan Region [3]. The trauma is common cause of higher morbidity and mortality rates in Iraq [4]. The emergency medicine in Iraq was unfortunately neglected medical field that needs higher improvement [5]. However, in last decades, there was a significant improvement in Kurdistan Health system parallel to economic evolution included development of specialized emergency hospitals and training of specialized medical staff [6]. Higher mortality rates reported in ED clarify some problems in health system specifically when aggravated in last decade's [7]. Many authors from different areas in world reported heart disease, road traffic injury, trauma and carcinoma are the main reasons for death in ED [8]. However, the etiology differs in various geographical locations [9]. In Iraq, mortality causes as detected in emergency department were cardiovascular disease, road traffic accidents and blast or bullet injuries. Accidents, circulatory system diseases, respiratory system diseases and cancers were the common death causes for 5 years (2007-2011) in Erbil city [10]. Worldwide, 15-60% of hospital reported mortalities occurred in ED [11]. These differences in hospital reported mortalities are related to many factors like crowding factor, type of mortality cause and type of hospital department [12, 13]. Nowadays, many literatures are held to discover the diagnosis of mortality and risk factors related to higher mortality rates in emergency departments [14, 15]. Unfortunately, the general levels and standards of emergency care system in Iraq are still underdeveloped because of lack in equipments, facilities and well training of staff [16]. The overcrowding and long length of stay in ED are accompanied by other poor sequences such as delayed thrombolysis; delayed antibiotic treatment pain suffering; patient dissatisfaction [17]; and an increased in-hospital and out-hospital mortality rates [18]. The main reasons for death in emergency departments of Kurdistan hospitals in previous years were injury, cancer stroke and cardiovascular diseases [20]. Reporting cause of death in ED is acquired through past medical, presenting medical history of patient from relatives or information from ambulance crews, hospital notes, or patient's private doctor notes. These information in conjunction with clinical status allows emergency physician to confirm the death causes and sharing it with local authorities. Unknown death causes or suspected cases are referred to Forensic Medicine to acquire the definite death causes. Suspected cases include death due to violence, trauma, poisoning or suicide, and if the doctor is unable to

certify the cause of death with reasonable certainty [21].

High death rates in ED of Kurdistan hospitals, evolving numbers of preventable death causes documented in these hospitals and scarcity of literatures discussing the mortality reasons in Kurdistan emergency hospitals or departments argued us to develop this study which aimed to detect the main causes of mortalities among patients admitted to Rozhhalat emergency hospital during one year duration.

2. PATIENTS and METHODS

This was a retrospective data review study conducted in Rozhhalat Emergency Hospital in Erbil city-Kurdistan through the period from 1st of January, to 31st of December, 2018. The study population was dead patients after admission to Rozhhalat Emergency Hospital. Age ≥8 years, in-hospital dead patients due to any cause except trauma and for one year period were the inclusion criteria. The exclusion criteria were pediatric age (less than 8 years), trauma, death on arrival and incomplete or missing data. A sample of 204 patients have died during the last year with age ranging from 8-92 years and average of 63.05 years and eligible to inclusion and exclusion criteria was taken. The ethical considerations were obtained according Helsinki Declaration regarding ethical approval of Health authorities and confidentiality of data.

The data were collected by the researcher from selected data of dead patients and fulfilling a prepared questionnaire. The questionnaire was designed by the researcher. The questionnaire included the followings: general characteristics (age, gender and occupation), hospital department in which patients died, past surgical history, past medical history, chief compliant on admission and final diagnosis of death. Diagnosis of death for selected patients was made officially by the senior on call at time of death depending on ICD-10 classification. The ways of death diagnosis is based on past medical history of dead patients, chief compliant on admission, current treatment, medical reports or investigations and some cases needed refer to Forensic Medicine to acquire the real cause of death (especially young patients with unknown cause of death). The incomplete or missing data regarding dead patients were neglected and excluded from the study.

The collected data were statistically managed and analyzed using the Statistical Package for Social Sciences software version 22. Fischer's exact test was applied for analyzing the data as suitable. Level of significance (P. value) of 0.05 or less was considered significant difference.

3. RESULTS

Rozhhalat emergency hospital is one of the two main emergency hospitals in Erbil governorate receiving on annual basis a sum of 9647patients at the wards, 5432 cases at reception, 781 at Intensive Care Unit (ICU) and finally 389 people at Respiratory Care Unit (RCU). Excluding traumatic cases, a total of 204 patients have died during the last year with age ranging from 8-92 years and average of 63.05 years, 56.9% of them were males and 43.1% were females. More than one third (38.7%) of the dead people were house wives, 34.8% were governmental employees, non-employed population contributed to 15.2% of the total sample size followed by 9.3% retired seniors and only 2% students. Approximate numbers of death cases were admitted to ER and ICU (38.7 and 39.7 consecutively), while RCU comprised to 12.3% and wards to only 9.3% of the total deaths. Most fatalities (61.3%) did not have any past surgical history in contrary only 38.7% of them had such history, (**Table 1**).

Studying past medical history of died patients in ED revealed no past medical history in 13.6% of them, while positive past medical history included co-morbidity (50.5%), cancer (14.2%), hypertension (6.9%), tuberculosis (4.4%), chronic kidney disease (1.5%), asthma (0.5%) and inflammatory bowel disease (0.5%). (**Table 2**).

As shown in (**Table 3**), common death causes for patients presented to Emergency hospital in last year were heart failure (22.8%), stroke (14.8%), myocardial infarction (12.8%), cancer (12.8%), septic shock (11.8%), brain hemorrhage (7.4%), renal failure (5%), liver failure (2.5%), upper gastrointestinal bleeding (1.9%), respiratory failure (1.9%), tuberculosis (1.4%), cardiogenic shock (1.4%). Hypovolemic shock (1.4%), pneumonia (0.9%), pulmonary embolism (0.4%), pulmonary edema (0.4%) and cholera (0.4%).

The common chief complaint of dead patients at presentation to ED was shortness of breath (35.8%), followed by; disturbed consciousness (21.1%), chest pain (6.7%), fatigability (4.7%), generalized abdominal pain (3.7%), fever (2.55), syncope (2.5%), etc. (**Table 4**)

The findings of (**Table 5**) revealed that there was non-significant statistical relationship between diagnosis and gender of dead cases (P=0.58). Heart failure was most common diagnosis among both males and females followed by stroke, myocardial infarction, cancer and septic shock.

There was a significant association between mortality diagnosis in and hospital departments (p=0.04); patients with MI were significantly died in emergency reward, while patients with heart failure were significantly died at intensive care unit. (**Table 6**).

Although no significant relationship between mortality diagnosis and previous occupation of dead patients in ED (p=0.25), employed patients and housewives died commonly due to heart failure,

while unemployed patients were died due to MI. (**Table 7**)

Table 1. Demographic data of dead patients.

Variables	Category	Frequency	Percent
Gender	Male	116	56.9
	Female	88	43.1
Occupation	Employed	71	34.8
	Non-employed	31	15.2
	House wife	79	38.7
	Retired	19	9.3
	Student	4	2
Department*	ED	79	38.7
	ICU	81	39.7
	RCU	25	12.3
	Ward	19	9.3
Past surgical history	Yes	79	38.7
	No	125	61.3
Total		204	100.0

*ED: Emergency department, ICU: Intensive Care Unit, RCU: Respiratory Care Unit

Table 2. Past medical history of study population

Past medical history	Frequency	Percent
None	28	13.6
Comorbidity	103	50.5
Cancer	29	14.2
HTN	14	6.9
DM	11	5.4
IHD	9	4.4
TB	5	2.5
CKD	3	1.5
Asthma	1	0.5
IBD	1	0.5
Total	204	100

HTN=Hypertension, IHD=Ischemic Heart disease, TB=Tuberculosis, CKD=Chronic
Kidney Disease, IBD=Inflammatory Bowel Disease.

Table 3. Diagnosis of cases on admission to hospital.

Cause	Frequency	Percent
Heart failure	46	22.5
Stroke	30	14.7
Myocardial infarction	26	12.7
Cancer	26	12.7
Septic shock	24	11.8
Brain hemorrhage	15	7.4
Renal failure	10	4.9
Liver failure	5	2.5
Upper GIT bleeding	4	2.0
Respiratory failure	4	2.0
Tuberculosis	3	1.5
Cardiogenic shock	3	1.5
Hypovolemic shock	3	1.5
Pneumonia	2	1.0
Pulmonary embolism	1	0.5
Pulmonary edema	1	0.5
Cholera	1	0.5
Total	**204**	**100.0**

Table 4. Chief complaints of study population.

Chief complaint	Frequency	Percent
SOB	73	35.8
Disturbed consciousness	43	21.1
Chest pain	14	6.7
Fatigability	10	4.7
Generalized abdominal pain	8	3.7
Fever	5	2.5
Syncope	5	2.5
Convulsion	4	2.0
Decreased oral intake	4	2.0
Vomiting	4	2.0
Diarrhea and vomiting	4	2.0
Bleeding per rectum	4	2.0
Palpitation	3	1.5
Head ache	3	1.5
Epigastric pain	3	1.5
Bloody vomiting	3	1.5
Limb weakness	2	1.0
Black tarry stool	2	1.0
Jaundice	2	1.0
Slurred speech	1	0.5
Generalized body ache	1	0.5
Urinary retention	1	0.5
Diarrhea	1	0.5
Generalized body swelling	1	0.5
Hematuria	1	0.5
Hemoptysis	1	0.5
Hoarseness of voice	1	0.5
Total	**204**	**100.0**

Table 5. Association between cause of death and gender of the studied group

Cause	Male		Female		Total	
Heart failure	28	24.1	18	20.5	46	22.5
Stroke	17	14.7	13	14.8	30	14.7
Myocardial infarction	13	11.2	13	14.8	26	12.7
Cancer	13	11.2	13	14.8	26	12.7
Septic shock	11	9.5	13	14.8	24	11.8
Renal failure	9	7.8	1	1.1	10	4.9
Brain hemorrhage	9	7.8	6	6.8	15	7.4
Upper GIT bleeding	3	2.6	1	1.1	4	2.0
Respiratory failure	3	2.6	1	1.1	4	2.0
Tuberculosis	2	1.7	1	1.1	3	1.5
Cardiogenic shock	2	1.7	1	1.1	3	1.5
Hypovolemic shock	2	1.7	1	1.1	3	1.5
Pulmonary embolism	1	0.9	0	0.0	1	0.5
Liver failure	1	0.9	4	4.5	5	2.5
Cholera	1	0.9	0	0.0	1	0.5
Pneumonia	1	0.9	1	1.1	2	1.0
Pulmonary edema	0	0.0	1	1.1	1	0.5
Total	**116**	**100.0**	**88**	**100.0**	**204**	**100.0**

Table 6. Association between diagnosis and hospital department

Diagnosis	Department							
	ER		ICU		RCU		Ward	
	No.	%	No.	%	No.	%	No.	%
Myocardial infarction	20	25.3	6	7.4	0	0.0	0	0.0
Pulmonary embolism	1	1.3	0	0.0	0	0.0	0	0.0
Septic shock	7	8.9	10	12.3	2	8.0	5	26.3
Renal failure	2	2.5	4	4.9	2	8.0	2	10.5
Liver failure	3	3.8	2	2.5	0	0.0	0	0.0
Stroke	14	17.7	9	11.1	2	8.0	5	26.3
Pulmonary edema	0	0.0	1	1.2	0	0.0	0	0.0
Tuberculosis	1	1.3	0	0.0	1	4.0	1	5.3
Cholera	0	0.0	1	1.2	0	0.0	0	0.0
Cardiogenic shock	3	3.8	0	0.0	0	0.0	0	0.0
Upper GIT bleeding	3	3.8	1	1.2	0	0.0	0	0.0
Respiratory failure	1	1.3	1	1.2	2	8.0	0	0.0
Cancer	9	11.4	13	16.0	4	16.0	0	0.0
Heart failure	13	16.5	23	28.4	5	20.0	5	26.3
Pneumonia	0	0.0	1	1.2	1	4.0	0	0.0
Brain hemorrhage	0	0.0	8	9.9	6	24.0	1	5.3
Hypovolemic shock	2	2.5	1	1.2	0	0.0	0	0.0
Total	**79**	100.0	**81**	100.0	**25**	100.0	**19**	100.0
P. value = 0.04								

Table 7. Association between diagnosis and previous occupation of dead people

Diagnosis	Employed		Non-employed		House wife		Retired		Student		Total
	No.	%	No.	%	No.	%	No.	%	No.	%	
Myocardial infarction	6	8.5	6	19.4	13	16.5	1	5.3	0	0.0	26
Pulmonary embolism	1	1.4	0	0.0	0	0.0	0	0.0	0	0.0	1
Septic shock	6	8.5	3	9.7	13	16.5	2	10.5	0	0.0	24
Renal failure	5	7.0	3	9.7	1	1.3	1	5.3	0	0.0	10
Liver failure	0	0.0	1	3.2	4	5.1	0	0.0	0	0.0	5
Stroke	10	14.1	4	12.9	11	13.9	4	21.1	1	25.0	30
Pulmonary edema	0	0.0	0	0.0	1	1.3	0	0.0	0	0.0	1
Tuberculosis	1	1.4	0	0.0	1	1.3	0	0.0	1	25.0	3
Cholera	0	0.0	0	0.0	0	0.0	1	5.3	0	0.0	1
Cardiogenic shock	1	1.4	1	3.2	1	1.3	0	0.0	0	0.0	3
Upper GIT bleeding	1	1.4	2	6.5	0	0.0	1	5.3	0	0.0	4
Respiratory failure	2	2.8	0	0.0	1	1.3	1	5.3	0	0.0	4
Cancer	8	11.3	5	16.1	11	13.9	1	5.3	1	25.0	26
Heart failure	20	28.2	1	3.2	17	21.5	4	21.1	0	0.0	42
Pneumonia	1	1.4	1	3.2	0	0.0	0	0.0	0	0.0	2
Brain hemorrhage	7	9.9	0	0.0	4	5.1	3	15.8	1	25.0	15
Hypovolemic shock	2	2.8	0	0.0	1	1.3	0	0.0	0	0.0	3
Total	71	100.0	31	100.0	79	100.0	19	100.0	4	100.0	204

P. value = 0.25

DISCUSSION

Health systems of developing countries are not focusing on emergency medical care. The appropriate emergency care is very essential in lowering preventable deaths and disabilities, mainly in poor countries [22]. Nationally, the emergency care system was disrupted and exhausted because of wars, sanction, unavailability of drugs and facilities, in addition to lack of infrastructure and training of staff [16]. The present study showed that common causes of mortality in Rozhhalat emergency hospital in Erbil city after exclusion of trauma were heart failure, stroke, myocardial infarction, cancer, etc. These findings are similar to results of Hagobian et al [23] study in Iraq which stated that cardiovascular diseases are the common cause of mortality in hospitals and outside hospitals after

trauma among Iraqi population [23]. Our study findings are consistent with results of Stefanovski et al [1] study in Bulgaria which found that most non-traumatic death causes in emergency department are due to cardiovascular diseases. Alimohammaadi et al [15] study in Iran reported that odds of patients' mortality increased when presented with cardiovascular diseases. Recent retrospective analysis implemented by Heymann et al [24] on emergency hospitals in Switzerland for duration of four years (2013-2016) found that main death etiology was cardiovascular diseases (56%), followed by cancers (18%) and trauma (8%), etc. A study carried out by Goulet et al [25] study in France found that more than half of unexpected mortalities in emergency department may be due to medical and could be prevented. However, our study findings are inconsistent with results of Søvø et al [26] study in Denmark which revealed that common ICD-10 death causes in emergency departments were injuries and poisoning, while cardiovascular diseases represented fourth common death cause. This inconsistency might be attributed to differences in population lifestyle, health culture, health system and infrastructure between different communities. In Iraq, there was an epidemiological transmission from epidemicity of infectious diseases to epidemicity of non-communicable diseases due to economic inflation in last decades which accompanied by changes in lifestyle to more prevalence of sedentary lifestyles and obesity with high increase in non-communicable disease prevalence [27]. However, the trauma especially that resulted from road traffic accidents is the main cause of mortality in emergency department of Erbil city hospitals [28]. Current study showed that co-morbidity was common past medical history in about half of died patients in ED. Similarly, Taylor et al [29] study reported that previous past medical co-morbidity is important predictor for in-hospital mortality rates. In present study, common chief complaint of dead patients at presentation to ED was shortness of breath. This finding coincides with results of Hale et al [30] study in USA which stated that dyspnea is the main clinical presentation highly utilized intensive care units of hospitals. Regarding gender of patients, male patients died in ED were more than females. Consistently, Ugare et al [31] study in Nigeria revealed dead male to dead female ratio in ED was 2.1:1. This male gender predominance in present study although trauma exclusion was due to fact that cardiovascular diseases are present later in females than males with higher mortality rate between male gender [32]. However, death related to heart failure was common for both genders in our study. Housewives and employed occupations were common among dead patients in ED and mainly died due to heart failure. This finding is similar to results of Price study in UK [33]. Our study revealed a significant association between mortality diagnosis in and hospital departments (p=0.04). Wakabayashi et al [34]

study in Japan found that higher in-hospital mortality rate was due to heart failure mainly reported in ICU. Our study concluded that heart failure, stroke, myocardial infarction and cancer are the common death causes of patients presented to Rozhhalat emergency hospital in Erbil city after exclusion of trauma. Further attention and more public health programs are needed to prevent earlier death due cardiovascular diseases and cancers.

CONCLUSIONS

Heart failure, stroke, myocardial infarction and cancer are the common causes of deaths among patients presented to Rozhhalat emergency hospital in Erbil city after exclusion of trauma.

Ethical Clearance

Ethical clearance and approval of the study are ascertain by the authors, all ethical issues and data collection were in accordance with the World Medical Association Declaration of Helsinki 2013 for ethical issues of researches. All official agreement were obtained.

Conflict of interest

None declared by the authors

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