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Understanding Mortality and Morbidity Meeting at Princess Marina Hospital: Case of Accident and Emergency Department (April 2014 to March 2015)

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Abstract

*Background**:** The incidence and spectrum of mortality and morbidity in Botswana are not well established. Mortality data can be provided through the hospital records and documentation.*

*Objectives**:** Based on the importance given to accident and emergency at princess marina hospital by both the leaders and the entire population in Botswana, it was opportune to conduct this study. The major objective is to establish some epidemiological markers of death in our facility and therefore to provide factors surrounding death and solutions to reduce mortality.*

Methods: A retrospective study has been conducted, based on monthly mortality and morbidity report provided by different doctors within the department.

Results: 27361 patients were seen during the said period with about 111 deaths (0.41 %). A total number of 10041(36.7 %) patients were admitted to different wards for in-patients management. A couple of patients were brought in death after sudden collapse at home or being involved in road traffic accident. Roughly 9 patients died in accident and emergency each month with a mean of 2280 patients monthly attending the department. 56 % of patient died with an internal medicine condition. 51 % of died in accident and emergency were young adult on the range of 14 – 49 year old. No significance value concerning the difference in gender.

*Conclusion**:** The study provided details and a preliminary answer to cause of death grossly. Despite of comorbidities and the high number of HIV patients at the age ranging between 14 and 49 year old, having a high percentage of patients adults dying in accident and emergency is alarming and suggestions had been given to shrink this number.*

Keywords: *mortality, morbidity, mortality and morbidity, princess marina hospital, accident and emergency department, brought in dead, died in casualty,*

Introduction

Background

The realization that errors play a significant role in mortality and morbidity in accident and emergency department together with poor triaging of the patients has generated interest and needs of quality improvement initiatives that took directly into human errors.

After initially updating the triage tool in 2009 and implementing it in 2010, and In order to provide high quality care , medical staff members in accident and emergency department at princess marina hospital engage quarterly , if possible, in an objective , non-judgmental review of adverse events and outcomes happened during the management of some selective patients .

Generally, the mortality and morbidity meeting will give a statistical report followed by a clear discussion concerning some selected cases of patients who died after being seen in the department or during their stay in the department.

The choice of these cases depends upon several criteria including, but not limited to, presenter's judgment, poor management (delayed attendance, treatment given, protocols followed…), lessons learned and improvement for the future.

Definition of concept

- The free Dictionary defines "mortality" as the quality and condition of being mortal. "Mortal" is considered to be a group like "human race".
- Morbidity is a term used to describe how often a disease occurs in a specific area or is a term used to describe a focus on death.
- Mortality and morbidity meeting is a conference where regularly the staff take an in-depth , franc and opened analysis of some incidents which happened during the management of some patients leading to death or near death; with the purpose of learning and improvement.

Objective of mortality and morbidity (M and M)

Mortality and morbidity meeting is one of the key component of workplace-based learning, providing an opportunity to the medical staff in accident and emergency to discuss errors and adverse events which occur in the department during a certain period of time. The discussion is always done in a very friendly and open manner.

During the meeting, the staff will answer to some specific questions:

- What happened?
- Why did it occur?
- How could the issue have been prevented or better managed?
- What are the key learning points?

Methodology

This is a retrospective study. An archival data collection and archival compilation were done to collect all the data for this report. Generally a Medical officer in accident and emergency in collaboration with Healthcare auxiliaries' staff conduct the data collection under the supervision of the medical officer.

Some tools will be used to collect data:

- Departmental admission book: this book recorded all the patients seen in the department.
- "Died in Accident and emergency" book: this book records all the patients died while in the department.
- "Brought in dead" book: for all death before arrival to the department.
- Nursing mortality and morbidity statistics
- Accident and emergency triage form: containing nurses and doctors 'notes.
- Medical record information store room.

After collecting all the data, the medical staff assigned for the M&M at a specific period compiles all the data.

After selecting cases for discussions, the concerned officer goes through the Notes (doctors and nurses) as well as outpatient cards if available and admitting department if reported.

During this report, we will give a statistical report of all the patients seen and died in Accident and emergency during the specific of time given. This will be followed by the presentation of some interesting case which was discussed by the department.

A discussion will be conducted generating conclusion and recommendation for the future at the end of the report.

Results and discussion

Presentation of the department

- Princess marina hospital is the biggest referral hospital with nearly 500 beds. It situated in the center of Gaborone, the capital city of Botswana. It is a specialized hospital running a multidisciplinary department, as teaching and tertiary hospital.

- The accident and emergency department is one of the units of the Hospital. It is the major entrance to the hospital. It is situated by the entrance of the hospital with an emergency gate, opposite to the transport office for ambulances. The accident and emergency department is divided into different areas including
  1. Head of department office:
  2. Triage office:
  3. Patient Waiting area
  4. Family waiting area
  5. Bays(1 to 10) and corridors(1 to 7)
  6. Resuscitation room
  7. Side laboratory
  8. Kitchen
  9. Sister in charge office
  10. Store room
  11. Disaster room
  12. Doctors station
  13. Nurse's station.
  14. Isolation room.
- At the time this data were collected, the medical staff comprises the head of department, one emergency specialist under University of Botswana, 10 medical officers, 4 residents, and 2 visiting residents.
- The nurse's staff comprises the matron and sister in charge of the unit, 15 nurses, and 7 health care auxiliaries.
- A private company provides pottering services and cleaning services.
- The accident and emergency department only admits to the ward or discharge to the referring hospital or home. The department does not contain an observation ward.
- The Accident and emergency department has the mandate to manage and stabilize efficiently and effectively trauma and critically ill patients.

Presentation of the results and interpretation

Table 1. *Summary of patients attended in Accident and emergency (A/E) from 01.04.2014 to 31.03.2015*

	Died in A/E	BID	Admission	Total
April14	8	27	804	2210
May14	13	22	757	2136
June14	9	17	757	2035
July14	6	30	820	2301
august14	18	28	855	2318
September14	8	25	889	2419
October14	7	13	833	2440
November14	6	17	823	2277
December14	10	11	752	1966
January15	7	8	732	2083
February15	7	8	763	2574
March15	12	11	1256	2602
Total	111	214	10041	27361
percentage	0.41	0.78	36.7	100

The table above represents the summary of all the patients seen and recorded according to their outcomes. For the period of April 2014 to march 2015, 27361 patients seek medical care in accident and emergency department at our facility. 36.7 % were admitted, while 0.41% died within the department. We still have quite a high number of brought in dead cases, despite of different information given to the public.

Table 2. Summary of patient died in Accident and Emergency (A/E) per month

Table 2.1. patients died in A/E during april2014

Month	Disease	Gender	Age	Source of referral
	Cancer breast with hyperglycemia	F	55	Local clinic
	Per Vaginalbleeding? malignancy	F	85	Local clinic
APRIL	Traditional medicine intoxication	M	47	EMS
	PCP	F	50	EMS
	Hepatomegaly ?cause	F	60	Local clinic
	Intestinal obstruction	F	40	District hospital
	HI/RTA	F	31	EMS
	AIDS	F	33	Local clinic

During April 2014, 8 patients died while still in the unit. More than half of them were on the range of 14-49 years old and only one male patient among all.

Table 2.2. patients died in A/E in May 2014

Month	Disease	Gender	Age	Source of referral
	PTB/Renal failure	M	35	District hospital
	Advanced breast Cancer	F	33	EMS
	Collapse ?cause	F	33	EMS
	RTA/Polytrauma	M	32	local hospital
	Hematuria?cause	M	72	Local clinic
May14	Hepatorenal failure with electrolyte imbalance	F	82	Local clinic
	PTB	F	55	EMS
	Acute respiratory distress?cause	F	39	Local clinic
	PTB	M	43	EMS
	Hepatorenal syndrome	F	37	Local hospital
	Aspiration pneumonia	M`	3	Local hospital
	Renal failure/HIV encephalitis	M	32	Local clinic
	Stevens Johnson's syndrome	M	39	Local clinic

13 patients died in May 2014 with a pediatric patient who came from a referring hospital. Mostly Female patients died during the course of this month. About 77 % were young adult. Among them only 1 has a road traffic accident. The remaining has some medical condition.

Table 2.3. patients died in A/e in June 2014

Month	Disease	Gender	Age	Source of referral
	Hemoperitoneum post blunt abdominal trauma	M	32	Local hospital
	Severe pneumonia/PCP	F	40	Local clinic
June14	Severe pneumonia with CCF exacerbation	F	43	Local clinic
	Severe pneumonia/septic shock	F	48	Self-referral
	Severe RTI	F	59	EMS
	Pleural effusion	F	34	Local hospital
	Aspiration pneumonia	F	29	Local clinic
	PCP	F	31	Local clinic
	PTB	M	48	EMS

9 deaths were recorded in June. All were adult with a 78 % of female and 22 % male. Except the old lady with severe RTI all the remaining are ranging between 14-49 years old.

Table 2.4. patients died in A/E in July 2014

	Diseases	Gender	Age	Source of referral
	PTB	F	33	Local clinic
	Hepatic encephalopathy	F	38	Local clinic
July	Subdural hemorrhage	M	42	Local hospital
	CVA	F	70	EMS
	AIDS	M	53	EMS
	Ruptured aneurysm	F	54	Local hospital

6 patients recorded dead. Oneunusual diagnosis of ruptured aneurysm had been reported as well. 2 third are female.

Table 2.5. patients died in A/E in august 2014

	Diseases	Gender	Age	Source of referral
	Renal failure	M	55	Self
	Severe Gastroenteritis	F	5 months	Local clinic
	Severe pneumonia	M	76	EMS
	Urosepsis	M	53	EMS

	PTB	F	32	Local clinic
	Anemia with CCF	M	81	Local clinic
	Severe pneumonia	Male	37	EMS
august	Severe malnutrition	M	10months	Local clinic
	Crypto meningitis	M	17	Local clinic
	Incarcerated hernia	M	70	Local clinic
	Polytrauma post RTA	M	53	EMS
	Crypto meningitis	F	48	EMS
	CVA	M	57	Local hospital
	Massive intracranial hemorrhage	M	36	Local clinic
	Pneumonia	M	36	Local hospital
	CCF	M	80	Local clinic
	Head injury post assault	F	80	Local hospital
	CRF	M	50	Local clinic

The highest number of death. 2 infants died in a/e during this period. There was a very unusually assault; an 80 years old female who died with head injury. 78% of deaths were male. About 60 % deaths beyond 50 years old.

Table 2.6. patients died in A/E in September 2014

	Diseases	Gender	Age	Source of referral
	Electrolyte imbalance with renal failure	F	46	Local hospital
	Hemorrhagic CVA	F	65	Local clinic
	CCF	M	81	Local hospital
September	Hypovolemic shock post trauma	M	27	Local clinic
	Urosepsis with urinary retention	M	49	Local clinic
	Severe sepsis	M	73	Local clinic
	PCP	F	40	Local clinic
	Acute abdomen(uterine perforation)	F	39	Local hospital

8 patients died in A/E. 63 % were ranging 14-49 years old.

Table 2.7. patients died in A/E in October 2014

	Diseases	Gender	Age	Sources of referral
	Tension pneumothorax post stab wound	M	39	Ems
	Severe dehydration /gastroenteritis	F	3 months	Local clinic
	Severe pneumonia	F	22	Local clinic
October	Advanced cancer of oral cavity	M	69	Local hospital
	Hypoglycemia	F	41	Local clinic
	Sepsis/anemia post infected bedsores	F	38	Local clinic
	Pulmonary edema/CCF	M	81	Local clinic

7 patients died during this period. The patient with Tension pneumothorax died due to a delay in management.1 infant died due to a diarrheal disease and 57% of patients were middle age. 57% of dead were female.

Table 2.8. patients died in A/E in November 2014

	Diseases	Gender	Age	Sources of referral
	PTB	M	30	Local clinic
November	Lower GI bleeding	M	54	Local clinic
	Sepsis	F	29	Local clinic
	Hypovolemic shock	F	66	Local hospital
	Severe head injury post RTA	M	8	Local hospital
	Metastatic liver cancer	M	73	EMS

6 deaths recorded. 2 third were female. 50 % of dead were beyond 50 years old and under age died due after being involved into a Road traffic accident.

Table 2.9. patients died in A/E in December 2014

	Severe respiratory syndrome? cause	M	51	Local clinic
	Hypokalemia	F	74	Self
	Ruptured esophageal varicose	M	23	Local clinic
	Hi post RTA	F	8months	Local hospital
	Bilateral subdural hematoma	M	59	Local hospital
	Polythrauma post	M	23	Local

	RTA			hospital
	Severe pneumonia	F	29	Local clinic
December	Mouth lower lip ulcer/abscess	M	47	EMS
	Cancer blood	M	29	Local hospital
	Internal bleeding post RTA	M	69	Local clinic

10 deaths, upon which 70% were male and 30 % female including a female infant involved in road traffic accident. 50 % of death was middle age.

Table 2.10. Patients died in A/e in January 2015

	Diseases	Gender	Age	Sources of referral
	Meningitis	F	57	Local clinic
	Intestinal obstruction	F	59	Local hospital
January15	Severe dehydration post GE	M	6	Local hospital
	Anemia	F	4	Local clinic
	CCF	M	71	Local clinic
	Stab wound	M	25	EMS
	Anorectal sinus	F	69	EMS

7 patients died including 2 pediatrics patients which have some medical conditions. 57%were female. And 57 % were beyond 50 years old.

Table 2.11. Patients died in A/E in February 2015

	Disease	Gender	Age	Sources of referral
	Head injury post RTA	M	46	EMS
	Head injury post assault	M	19	Local hospital
	DKA with severe metabolic acidosis	M	50	EMS
February	Sepsis	M	43	Local hospital
	Acute kidney injury with metabolic acidosis	M	47	Local hospital
	PTB	M	46	EMS
	PCP	M	45	EMS

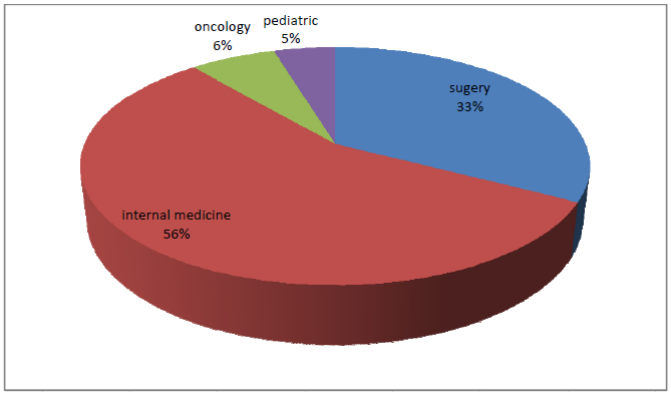
7 deaths. All were male and 85 % of them ranged between 14 and 49 years old.

Table 2.12. Patients died in A/e in March 2015

	Disease	Gender	Age	Source of referral
	End stage renal failure/HTA/DM	M	67	Local clinic
	Sepsis with hepatic failure	F	36	EMS
	Acute pulmonary edema	F	32	Local clinic
	PCP	M	2months	Local hospital
March	Hypokalemia/anemia	F	54	Local clinic
	Bronchiectasis	F	52	Local hospital
	Urosepsis with hydronephrosis/bph	M	85	EMS
	Cancer prostate/copd	M	67	EMS
	Advanced canceresophagus	F	66	Local clinic
	Polythrauma post RTA	F	38	Local hospital
	Intracranial hemorrhage	F	67	Local hospital
	Brain mass with ?PE post DVT/ severe dehydration	M	64	Local hospital

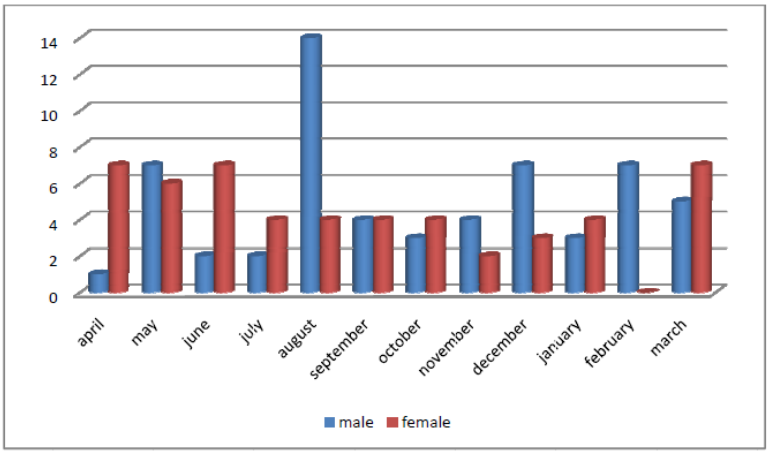
12 patients were recorded death in March 2015 including 1 infant who had severe pneumocystis carinii pneumonia. 67% had more than 50years old and 58% were female.

In summary, the previous 12 tables recorded the patients died in Accident and emergency par month. They give us an idea about their ages, genders and the sources of referral. The types of diagnosis are clearly stated. Patients died either from acute or chronic conditions. The next few tables and graphs will expose these deaths with some specificities.



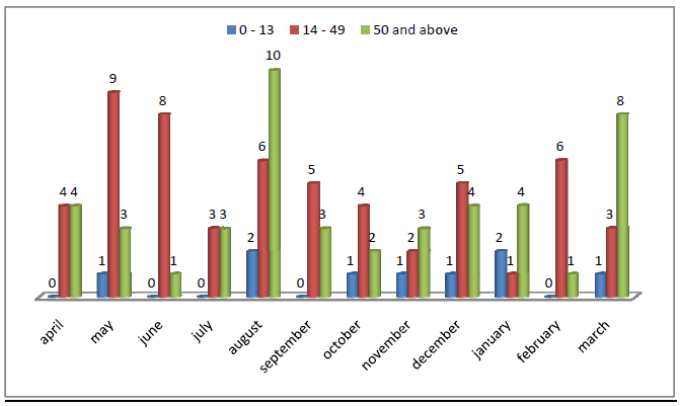
Graph 1. Summary of patients died in A/E by specialty

The above graph shows the patients died based of the specialty of interest. Most patients have an internal medical condition at 56 %, 33% patients had some surgical conditions including traumas. 6% of patients died from cancer and 5% was pediatric patients.



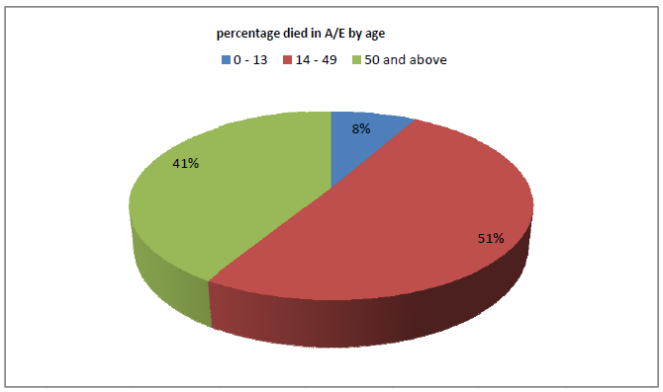
Graph 2. Patients died in A/E by sex

The histogram shows how patients died in a/e were selected per gender. It doesn't show match different in the management of the patients. Overall out of the 111 patients died in A/E, 59 (53%) were male and 52 (47%) were female.



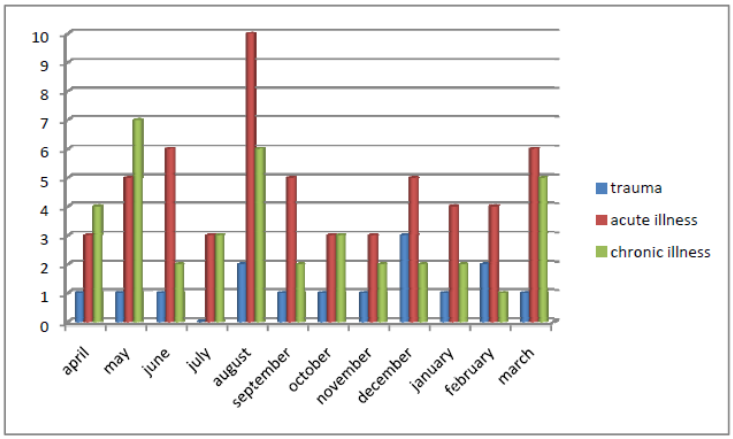
Graph 3. Patients died in A/E by age

Generally, very few pediatric patients died in a/e. young adult and mostly elderly with some chronic disease have shown to be the most patient died in a/e. 9(8%) children died, 56(51%) deaths ranged on 13 – 49 years and 46(41%) deaths from 50 years and above.



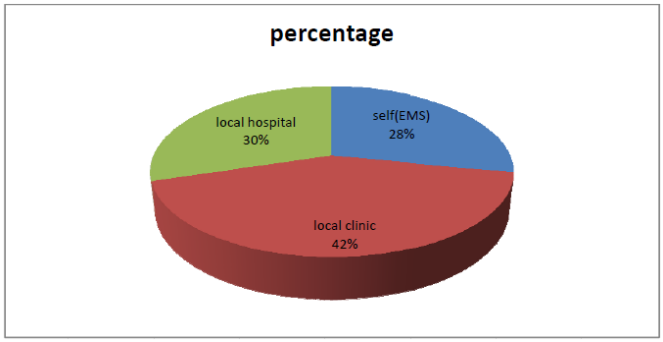
Graph 4. Overall patients died in A/E by age

51% of patients died as young adult (14 to 49). 41% were above 50 and pediatric representing 8%.



Graph 5. Trauma vs. non traumatic cause of death

The histogram above compares the condition which causes death to some patients each month. In overall, most patients died from acute illness followed by chronic patients. Trauma is not a highest cause of mortality our settings.



Graph 6. Patients died in A/E per sources of referral

The pi-graph shows the source of referral. 42% came from local clinic in the same area with the hospital. 30 % from local hospitals while 28% self-referred.

Case discussion

We will not close this article without presentation at least on patient died during his stay in our department. Many cases had been reported and discussed during the past meetings due to their interest. Our attention had been retained by a trauma patient presented to the department from local hospital. We are going to report and discuss the issues raised in the management of this patient.

This is a patient M.O., male, 32 year old referred from district hospital with a diagnosis of Polytrauma post road traffic accident(fracture distal Left humerus, Pelvic Left ischio ilio pubic bone, old fracture both tibia/fibula proximal and distal)

The patient arrived in the department of accident and emergency accompanied by a nurse at 01.05AM. The patient was registered at 05.21AM and attended to by an A/E triage nurse 2 minutes later.

At this time, the complaints remain the same with the vital signs as followed: T36.4, RR15, P124, and BP129/93

The patient was codified “orange” as per the triage system used in our setting.

The emergency doctor attended to the patients about 30 minutes later, raising the same complaints like RTA victim who was hit by amoving vehicle and sustained multiple injuries.

The patient was smelling alcohol with blood stained on the clothes. Despite of the pain, the patient was communicating well with a spontaneous breathing. A diagnosis of Polytrauma was made. Some investigations were done and the relevant specialties were informed about the patients.

The general surgeon attended the patient at 9am and planned to review after an abdominal scan is done. The orthopedic medical officer attended the patient at 9.20am and made a diagnosis of multiple fractures. He informed the orthopedic surgeon and prepared the patient for operation.

At 1120, the anesthetist was called. He reported being busy with another patient. He requested that the patient can be prepared for operation.

At 11.30, a new emergency from the surgical ward had been taken to theatre. It was a weekend and there was shortage of staff in theatre.

The patient remains in accident and emergency until when theatre will be free.

At 12.00, the vital sign shows that the patient is in hypovolemic shock.

The patient was called for theatre at 16.05, time when the patient deteriorated.

At 16.07 the 2 surgeons were informed to go to theatre and at 16.15 the patient had a cardiac arrest.

The patient was resuscitated unsuccessfully and was certified death at 17.20.

This case retained our attention due to some multiple issues in management which had been raised.

The patient was a young adult with all his future in front.

Time management and communication were very poor during the follow up of this patient. Despite of the fact that the patient was in shock from arrival, there was a delay in taking the patient to theatre. Also another case from the ward took over a patient with an internal bleeding in accident and emergency. The handling of a hand–over patient: this patient remains in accident and emergency during 3 different shifts. Mostly hand-over patient has a high rate of mortality in accident and emergency worldwide. The shortage of staff and the availability of facilities like theatre room during the weekend should also be considered as risk factors to lose some patients.

Discussion and challenges

Discussion of result

During this budgetary year, the accident and emergency department received about 27000 patients. Out of this number, less than 0.5 patients died in the department. This result is equally comparable to the one reported in the 2013 compilation of morbidity and mortality.

Table 2 shows us different diseases which led to death in emergency room. Patients can come in walking or in a stretcher in accident and emergency. Each accident of emergency expects to receive acutely ill patient. But our recorded shows quite significant number of chronically-ill patients. This can be explained by the fact that our setting is the main entrance of the hospital and some chronic patients can have some acute exacerbation of their conditions while other are on end-stage of their disease(e.g. patients with cancers on palliative care).

Table 3 completes the previous one showing the specialty which has the highest number of death. Internal medicine represents almost half of the patient died in the casualty department due partly to the high prevalence of chronically ill condition like HIV/AIDS and cancer as well as some metabolic disorder and cardiovascular disorder.

Looking to the graph 5, generally trauma patients are well managed in our setting. This explains why patients died due to trauma are less in number compare to non- traumatic cause of death (acute and chronic illness together). But an audit in trauma patient is still important. I am refereeing to the case presented previously as an example of a poorly manage patient. But this circumstance was explained by a poor availability of resources.

It was also found that more than half of patients died during that year were between 14 and 49 years old. Considering that chronic diseases have the highest number of death, some questions need to be answered through other researches to try and establish the link between the age and death.

Based on the source of referral, patients were coming from different source. The source of referral should not indicate the severity of the condition. We need to emphasize the

management of self-referral patients. 28% patients were self-referred and died in Accident and emergency. this has the same strength of importance with the patient referred from local hospitals (district and primary hospitals). It also means that walk-in patients should receive the same attention as referred patients until proven otherwise.

Challenges

The management of patients in accident and emergency need skills and teamwork. The challenges will be summarized on

- lack of team work mostly
- Lack of experienced medical and nurse staff
- Shortage of staff

Teamwork:

To save life especially in a trauma patients need a multidisciplinary approach. Based on the case presented previously, it shows clearly there was miscommunication between teams and specialties.

Experience and inexperienced officers in accident and emergency

The report shows a pick of death in august. During this period there is movement of medical and nursing staff within the hospital.

Shortage of staff

In the previous case, the patient was found in cardiac arrest due to the low number of staff in the department.

Conclusion and recommendations

Accident and emergency at princess marina hospital has remained a center of excellence; and a departmental headlight for the entire hospital as well as the country.

During this report, the accident and emergency shows its capability to contain a high number of patients at a very low rate of death. This is very appreciable for the department. Still some challenges are raised and need to be addressed in goal to reduce the death rate to 0.

An effort has to be made to help chronically ill patient on the management of their condition. This will improve adherence to treatment and the quality of life for most of them.

Some delays in the management of patients by the admitting team (other specialties) led to dramatic death of some of our patients. This exposed clearly a poor collaboration from other specialty.

Based on the above mentioned findings, we recommend

- Staff training should be provided regularly to improve the quality of care of patient;
- Staff shortage should be resolved as soon as possible;
- Trauma team or multidisciplinary team should be established urgently to allow their continuous presence on the side of the Polytrauma patient;
- Staff should not be transferred in bulk as this reduces the quality of care in the department.

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