CRITERIA OF REFERRALS, ADMISSIONS AND STANDARD OF CARE OF PATIENTS SENT TO HIGH DEPENDENCY UNIT POST-SURGERY IN KUWAIT TEACHING HOSPITAL

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Abstract

Objective: To compare the criteria of admissions, referrals and service quality of the said hospital with the standard guidelines followed in different institutes and societies worldwide.

Material and Methods: A retrospective study was done.Secondary data was collected from the hospital archives from 1st June 2020 to 31stMay 2021. Documents and files of all the patients admitted post-operatively to the high dependency unit were studied and data was collected. The data were analysed in SPSS version 26.

Results: A total of 100 patients were admitted to the HDU post-op. 100% 0f these patients were sent to the HDU without mentioning any specific admission criteria. 64 patients were sent to the HDU after surgery without any referrals or notes, while progress reports and vitals were noted in 60 patients by a medical officer and in 32 patients by a house officer.

Conclusion: Vitals of the patients were documented on regular basis, but the criteria of their admissions and referrals to HDU Post-Op are not mentioned. Receiving of the patient in HDU was not properly documented. Staff should be increased in number and training to match the standards worldwide. The equipment is scarce too; also needs updating.

Keywords: HDU, Referral, Admissions, Audit, Post-Operative, Kuwait Teaching Hospital, Peshawar.
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Introduction: Acutely ill patients are usually divided into two major groups, those needing invasive ventilation and are with multiple organ failure, and those with single organ dysfunction and in need of non-invasive ventilation. The former is said to be kept and cared for in an Intensive care unit (ICU) while the latter are cared for in the High dependency unit(HDU)[1].

HDU is a vital unit of a hospital, caring for patients who are critically ill. Research shows evidence, that the existence of an HDU with defined admission criteria may lead to improved patient outcomes. The incidence of cardiac arrests decreased on the medical wards by 39% after the establishment of an HDU[2]. A study suggested that high dependency care could have prevented 17% of deaths and permanent disabilities after surgery and 6% of major postoperative complications[3].

So, what is an HDU? This question has been answered by different societies, namely British National Health Service, The Association Of Anaesthetists of Great Britain and Ireland, and the Faculty of Intensive Care of the Australian and New Zealand College of Anaesthetists, in different ways. In a broader perspective, HDU is a unit that catersfor those patients needing more care than a general ward but less than those needing an intensive care unit for their condition. Components of an HDU that are mentioned by societies worldwide are summarized in **Table 1**.For this matter, different criteria of admissions, referral and discharge are made available at different times by societies and associations. These decisions are made after assessing patient status, the severity of the condition, type of treatment and intervention needed, length of stay and specialities needed for that patient[7-8].

Different scoring systems are also used to assess the patient swiftly and make the referral fast enough without wasting any time. These systems include some physiological as well as anatomical scoring systems; namely Modified Early Warning Score (MEWS), Medical Emergency Team Score (MET Score), Acute Physiology And Chronic Health Evaluation (APACHE), Simplified Acute Physiology Score (SAPS) as physiological scoring systems, while Organ Dysfunction Score (ODS), Sepsis Related Organ Failure (SOFA), Multiple Organ Dysfunction Score (MODS) as anatomical scoring systems[9].

The college of Intensive Care Medicine of Australia and New Zealand have laid certain rules for an HDU to have state of the art care for patients admitted there. As for staffing, they implied that the medical director, who would serve as the supervisor of the HDU should be a fellow in intensive care medicine. An intensivist/intensive care specialist and a medical officer with substantial experience in intensive care should be present in the HDU at all times. The nurse in charge should have a degree/diploma in intensive care medicine. The nurse-to-patient ratio should be 2:1 and 2 registered nurses should always be present in the HDU when a patient is admitted. The medical director should arrange educational programs and sittings for the staff so they are well trained in intensive care[10].

This paper sheds light on an HDU setting in a tertiary care setup and how is it performing with all the data available on the criteria of referrals, admissions and quality of a well-equipped HDU.

Methods and Materials: A retrospective study was conducted on data from the 1st of June 2020 to the 31st of May 2021 in a four-bedded HDU of Kuwait Teaching Hospital. All the documents and files from the hospital archives concerning the patients admitted within this time period were collected. Data on admission criteria, referral made post-op, referral received in the HDU and daily progress report was collected. The staff was interviewed andthe qualifications of on-duty doctors, nurses as well as those in charge were asked and verified by them.Duty hours of nurses and doctors were also made part of the data collected. Equipment was analysed and the records were seen from the register to know what was available in the past months. Data was kept confidential with the principal investigator. It was analysed in SPSS version 26.

Result: A total of 100 patient files were seen who were admitted to the HDU after surgery. The average length of stay of a patient in the HDU was 136.5 hours (5.7 days), with 360 hrs (15 days) being the maximum length of stay while 24 hours (1 day) being the minimum.

Most of the patients (17 in number) stayed in the HDU for either 96 hours or 120 hours. 84 patients were discharged from the HDU and stepped down into the general ward after recovery, while 14 patients expired and 2 files had no mention of the status of the patient. For admission in HDU, admission criteria are immensely important. In this study, we found out that all patients were sent to the HDU without applying any admission criteria or scoring system, or at least it was not documented anywhere in the patient file**[Table 2/Graph1]**. 64 referrals (64%) from the operation theatre (OT) to the HDU were made without documenting or mentioning, while 21 referrals (21%) were made by a medical officer, 7 (7%) were made by either a senior or junior registrar, 4 (4%) were made by a professor and 4 (4%) were made by a house officer **[Table 3/Graph 2]**. These referrals should have been received by the on-duty doctor, but, 65 (65%) files had no mention of a receiving on them, while 25 (25%) patients were received by the on-duty medical officer. 6 (6%) were received by a house officer whereas 4 (4%) patients were received by either a senior or junior registrar **[Table 4/Graph 3]**. The daily progress report of every patient, informing about their vitals, condition and any active complaint were also analysed. 5 (5%) patients had no progress notes in their files, while 95 (95%) files had daily progress reports mentioned in them, with most of them (60 %) taken by the on-duty medical officer.

As for staffing, their interviews told that the nurse-to-patient ratio from 8am to 2pm was 1:2, and from 2pm until 8am the next morning it was 1:4. Duty hours for nurses as well as the on-duty medical officer were 6 hours whereas for the house officer it was 12 hours. The qualification of the nurse in charge of the HDU was not intensive care specific. She is a senior nurse with 8 years experience in nursing in total and 6 months experience in HDU. She is not specialized in intensive care and has no certificate or diploma in intensive care medicine. The nurse on duty, other than the nurse in charge is assigned as per the availability. It can be an intern, a student or a junior nurse, given the availability of the staff. The doctor in charge is a senior registrar of surgery, but without any specific training in intensive care medicine. The doctor on duty is usually a medical officer of surgery, assisted with a house officer in the surgical department**[Table 5]**.

The emergency medication present in the HDU was updated daily. But the list of equipment present, was not according to that, provided by the College of Intensive Care of the Australia and New Zealand College. There was a shortage of non-invasive ventilation equipment, central line catheters, ECG machine, CPAP and BiPAP as well as outreach to a ventilator was not promptly available. The defibrillator was not in a working condition and was called for from the CCU in case of an emergency**[Table 6]**.

Discussion: Surgical patients once operated on and are ready to be shifted, need a thorough assessment so it is easily decided if they are to be shifted to an HDU or general ward. Our research showed that most of the patients sent to the HDU were not assessed on any scoring system or criteria whereas studies have shown that hospitals use different scoring systems; namely APACHE II and Risk stratification system to shift the patient to an HDU[11-12].

The staff deployed in the HDU should have proper experience and expertise according to the needs of critical care management as guided by the college of intensive care of Australia and New Zealand in their policy document IC-13, in contrast to which, the doctor in charge had no expertise in critical care medicine and the nursing staff was not properly trained in critical care as well. The handing over of the patients between the OT and HDU should be properly documented and referral policies should be clear, which was not the case in our findings.

The scarcity of high dependency units in the province demands a well-established and well equipped HDU where it is in place. For that matter, this HDU should be upgraded so it can provide the best critical care facilities, in line

with the recommendations and practices of the hospitals worldwide.

Conclusions: The HDU had no admission criteria in place for the admission of the patients and most of the admissions are done verbally. The referrals are also not documented as per guidelines of the intensive care societies working worldwide. The staff was short and not well-trained to handle patients in HDU needing emergency handling. The equipment is scares too and needs upgradation.

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Components of an HDU[4-6] [Table 1]
1. Does not normally accept patients requiring mechanical ventilation.
2. Provides invasive monitoring and support for patients with, or at risk of developing, acute (or acute on chronic) single organ failure. (An associated co-morbidity may convert a need for high dependency care to a need for intensive care. Multi-organ failure should be managed in the ICU.)

3. Does not regularly admit patients requiring frequent non-specialist nursing interventions only, such as non-invasive clinical observations.
4. Specifically staffed and equipped section of an intensive care complex.
5. Provides an intermediate level of clinical care between a general ward and intensive care
6. Acts as a “step-up” or “step-down” unit between the level of care delivered on a general ward and intensive care

Criteria of referrals, admissions and standard of care of patients sent to High Dependency Unit Post-Surgery in Kuwait Teaching Hospital

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Admission Criteria [Table 2]		
	Frequency	**Percentage (%)**
Early Warning Score (EWS)	**-**	**-**
Modified Early Warning Score (MEWS)	**-**	**-**
Ranson’s Criteria	**-**	**-**
Acute Physiological and Chronic Health Evaluation (APACHE II)	**-**	**-**
Not Mentioned	**100**	**100**

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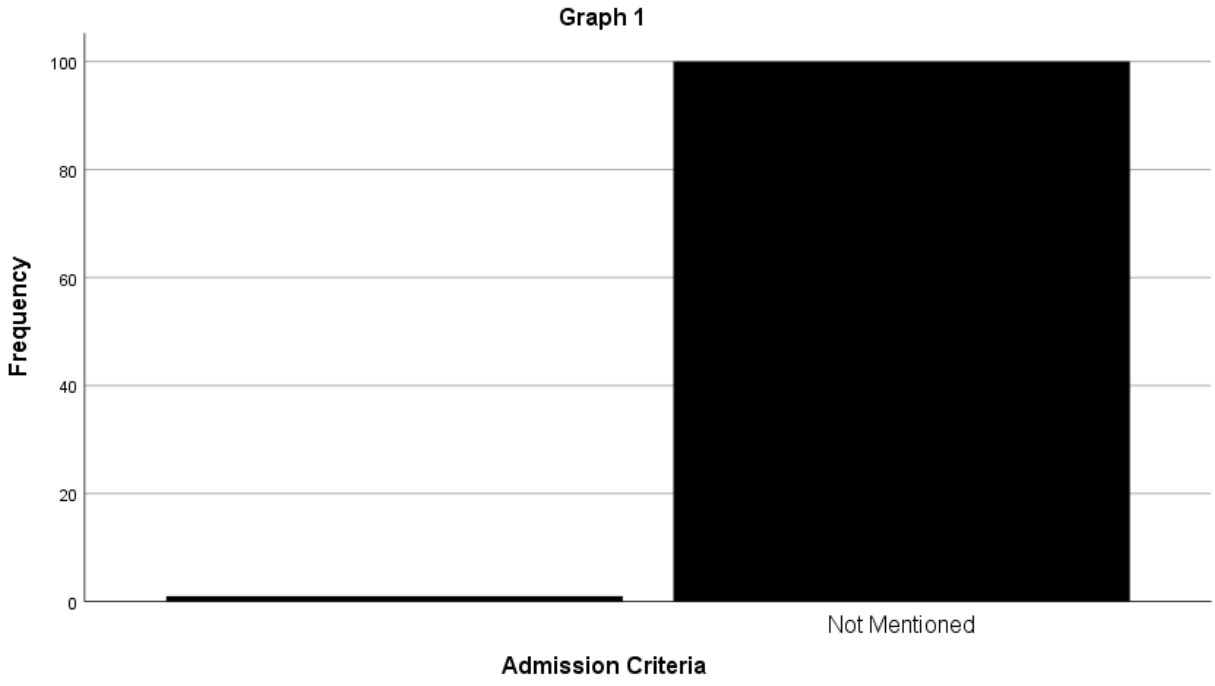

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Referral Made [Table 3]		
Frequency		**Percentage (%)**
Professor	**4**	**4**
Senior Registrar/Junior Registrar	**7**	**7**
Medical Officer	**21**	**21**
House Officer	**4**	**4**
None	**64**	**64**
Total	**100**	**100**

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Referrals Received [Table 4]		
	Frequency	**Percentage (%)**
Professor	**-**	**-**
Senior/Junior Registrar	**4**	**42**
Medical Officer	**25**	**25**
House Officer	**6**	**6**
None	**65**	**65**
Total	**100**	**100**

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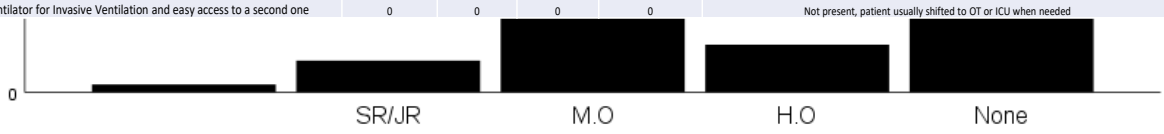
Graph 3

Equipment	Inventory [Table 5] June-Aug	Sep-Nov	Dec-Feb	March-May	Remarks by Staff
Hand Ventilating Assembly (Ambu,Mask,O2 Tubing)	1,1,1	1,1,1	1,1,1	1,1,1	1 can sometime not suffice the need of the unit, it can be dangerous
Suction Apparatus	4	4	4	4	It is in working condition and is used when needed but suction tubes are short and not checked regularly
Oxygen therapy equipment	4	4	4	4	Properly working and used according to the needs
Airway Access Equipment (Laryngoscope, Endotracheal Tube)	2,2	2,2	2,2	2,2	OT/Anaesthesia staff is called upon for its usage. Nurses are not trained for it
Vascular Access Equipment (Canulas, Central line catheters)	4,0	4,0	4,0	4,0	Canulas are present, CV catheters are not. Asked from patients on demand
Monitoring Equipment (Invasive&Non Invasive)	4	4	4	4	Vital monitors are attached to every bed
Defibrillator	1	1	1	1	1 defibrellator is present but not in working condition. CCU defib is used. Nurses are not trained for it
Equipment to control Patient's temperature	4	4	4	4	Present in form of infusions and tablets
Chest Drainage Equipment	1	1	1	1	1 Chest tube is present in the crash cart but no air tight seal bag present
Infusions and Specialized Pumps (N/S, D/S, Dial Flow, Hypertonics)	5,5,2,5	5,5,2,5	5,5,2,5	5,5,2,5	Present in crash cart and used according to the plan
Portable Transport Equipment (Strecher, Wheelchair)	1,1	1,1	1,1	1,1	Used when needed
Specialized Beds	4	4	4	4	HDU is 4 bedded with all being specialized
System for Non-Invasive Ventilation (CPAP,BiPAP)	0,0	0,0	0,0	0,0	Not present, ICU is called upon but subjected to availability
One Ventilator for Invasive Ventilation and easy access to a second one	0	0	0	0	Not present, patient usually shifted to OT or ICU when needed



Referral Recieved

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