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Inappropriate Admission and Hospitalization in Maternity and Children Teaching Hospital in Al-Diwaniya City, Iraq

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Abstract--- Objectives: *Assessment, degree and associated factors of in appropriateness of admission in children hospital`s wards in Al-Diwaniya city, Iraq, with the impact of other variables.* ***Methods:*** *It is across-sectional study on asample of children who presented in the emergency unit of the children teaching hospital. The following data were taken which include socio demography qualities; address; the date, ward, the days in the week, and admission types. The study performed over a6-month period (December2016 to June 2017). All of 1,723 admissions, were reviewed. (Using the Pediatric Appropriateness Evaluation Protocol for children patients).* ***Results:*** *A total of 1723children was surveyed. Overall, 25.1% from the hospital`s admissions were appeared to be inappropriate. Our result shows their proper admission was significantly higher with the age between 1 – 5 year (p<0.001).The inappropriate hospitalizations were essentially higher if patients were females, and if admissions were non- urgent. The fundamental purposes behind improper utilize were doctor's facility association and an over-wary doctor in the admissions of a patient and referral to hospital`s emergency room by doctors work out the hospital. Patients presented during holidays demonstrated a high percent, also improper admissions were higher for medical rather than surgical patients (P<0.001) at presentation.* ***Conclusion:*** *improper admission is high in maternity and children teaching hospital in Al-Diwaniya, most likely because of the generally free social insurance administrations, parental inclination for healing center care, simple access to clinic administrations, and deficient instruction about the condition of the case. Recommend the requirement for a more communication amongst doctor's facility and group based administrations to lessen such impropriety and for a proceeding with a training framework to characterize institutionalized rules.*

Keywords--- *Appropriate Evaluation Protocol (AEP), Inappropriate Admission, Iraq.*

I. INTRODUCTION

We use the term inappropriate to refer to those admissions that could be treated adequately on an outpatient basis.

In the research programs, appropriate admission has been defined as: ‘admission of patient for him there`s no choice other than admission, With such an advanced technology level and their admission is necessary even if there are choices with a lower level of technology in the health care system’. In contrast, inappropriate admissions mean:

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‘admission of patient for him there might potentially be another choice with lower technology level than the hospital”. It means that their admission is not necessary at that time. Appropriate hospitalization involves the hospitalization of patient who needs constant health care and patients whose care is not possible in a health care setting other than a hospital, e.g. an outpatient clinic or a day care center. The decrease in inappropriate hospitalization will improve the hospital efficiency, shorten the waiting lists, and decrease the health care costs without any reduction in the quality of services. On the other hand, in appropriate hospitalization days increase the hospitalization cost, decreases the accessibility of the resources for the patients with critical conditions, and exposes the patients to the hospital infections. Inadequate admissions in acute hospitals remain a topic of interest after two decades of review with instruments based on explicit criteria. Inadequate hospitalizations in medical services remain between 10 and 20%, although some studies have observed a decrease 14. The main causes of inadequacy: (income to perform diagnostic and/or therapeutic procedures that could be performed ambulatory, problems of organization of the hospital and the style of practice of the doctors) .

Using assessment program, like “the Appropriateness Evaluation Protocol (AEP)", the Protocol showed that ten to thirty percent of hospitalizations are medically not necessary [19, 20]. This "AEP" was first designed, and developed in the U.S.A by "Gertman and Restuccia"[21] to assess potentially unnecessary admissions. Twenty "objective criteria" items, correlated to medical service, nursing/ life support service, with patient`s condition were incorporated into this protocol. The "pediatric version of the AEP (PAEP) (appendix)"was derived from the original "AEP" by Kempar [22]. This "PAEP" is a commonly applied tool in evaluating improper hospitalization for children. The validity of PAEP have been tested several times [23].

II. METHODS

Childbirth and children teaching hospital is a main pediatric hospital in Al-Diwaniya city which serves a population of approximately 1,600,000.

About 290 children under12 y. attending emergency unit every day over a period of 6 months from December 2016 to June 2017.

A cross-section study was performed on 1,723pediatric patient[801 males and 922 females; age range from birth to12 y.].

Patients' qualities, for example, age, sex, time of admissions, kind of admissions (routine or emergency), address (city of living arrangement), sort of the confirmation day (workday or end of the week/occasion) and kind of referral were utilizing the Statistical Package for the Social Sciences program (SPSS).

Resident doctors in casualty ward helped in data collection by a special form containing PAEP criteria for some ewly admitted patients (at the first day), record any hospitalized patient in each unit of the hospital (pediatric urgical unit, pediatric medicine), and also depend on patients' files in difficult cases. And all admissions were evaluated according to PAEP criteria. An Appropriateness Evaluation Protocol (AEP) was utilized as the estimation device of propriety and wrongness of admissions and hospitalization days in this investigation (underneath in appendix).

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Statistical Analysis

Statistics performed by using statistical package of social sciences program version 20. Frequencies and percentages used to present categorical variables. Pearson's chi square (X2) was used to find the associations between categorical variables, p value less than or equal 0.05 was considered significant

III. RESULT

All 1723 medical files and cases of patients who were hospitalized in pediatric units throughout the research time (31/12/2016- 30/6/2017) in the maternity and children, teaching hospital in Al-Diwaniya city on randomly selected were surveyed and the principle characteristics are presented in Table 1

The study group consisted of 1723 patients—1622 on pediatrics medical ward, 101 on pediatrics surgery.

Out of a total of1723 recorded admissions, 1291 were appropriate and 432 were inappropriate, which results in 25.1% of inappropriate admissions.

Of the 1723 patients, 432 (25.1%) were thought to be improperly conceded in light of "PAEP". From those 432 children, 96 (22.2%) were below 1 y. of age; 201 (46.5%) were 1 - 5 yearsand 135 (31.3%) were > 5 y. of age. Groups comparisons how the inappropriate admissions were less in patients younger than one y. old (96/522; 18.4%) than in the other 2 groups (201/612, 32.8%, 135/589, 22.9%) this difference was statistically significant, ($p< 0.001$).

272 (29.5%) of the 922 female patients and 160 (19.9%) of the 801 male patients were classified as inappropriate admissions, this difference is significant, ($p< 0.001$).

From admissions in the morning and early afternoon; 126/516 (24.4%) were improper admissions; 168/658 (25.5%) afternoon admissions and 138/549 (25.1%) night admission were also improper admission. The distinctions were measurably not significant; ($p =0.908$).

From 1723 children, 790 (45.9%) were taken to emergency unit on "a self-referral basis" and the value of improper admissions is (302) 38.2%. In those 650 children who were sended from the primary health centers, the number of improper admissions is 14.3% (650/93), others 283/37 inappropriate admission was 13.1%.This was significantly below the number of inappropriate admissions in the self-referred group; ($p< 0.001$). (Table 1).

Residence

Most patients, (262/905, 28.9%) were resident in Al-Diwanyia, the remaining (170/818, 20.8 %), had to transport to reach the hospital. The percentages of inappropriateness at admission were 28.9% for residents and 20.8% of patients from other areas. This comparison for appropriateness was statistically significant ($p< 0.001$).

Day of Admission

Inappropriateness was related to the days in week in which the patients reached the first day -hospital care. Being highest from Thursday to Saturday contrasted with different days (Thursday- Saturday = 304/1170, 25.9%), Sunday – Wednesday=128/553, 23.1 %) $p=0.205$.

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The extension of improper admission was higher at holiday days than during workday, 287/950,145/773, 30.2% and 18.8% respectively p<0.001.

Type of Treatment

Rates of improper admission were highest in general pediatric wards (426/1622, 26.3 %) than pediatric surgical wards (6/101, 5.9 %) statistically significant (p< 0.001).

Type of Admission

The Inappropriate hospitalization days were observed to be more in case of routine admissions (non-urgent patients) 273/1008, 27.1% than emergency ones 159/715, 22.2 %, statistically significant (p< 0.022).

Table 1: Pediatric Hospital Admissions According to Specified Characteristics (n = 1723)

Study variable	Subgroups	Type of admission				Total		P
		Appropriate		Inappropriate				
		NO.	%	NO.	%	NO.	%	
Age	< 1 year	426	33.0%	96	22.2%	522	30.3%	<0.001*
	1- 5 year	411	31.8%	201	46.5%	612	35.5%	
	>5 year	454	35.2%	135	31.3%	589	34.2%	
	Total	1291	100.0%	432	100.0%	1723	100.0%	
Gender	Male	641	49.7%	160	37.0%	801	46.5%	<0.001*
	Female	650	50.3%	272	63.0%	922	53.5%	
	Total	1291	100.0%	432	100.0%	1723	100.0%	
Time of admission	Morning1	390	30.2%	126	29.2%	516	29.9%	0.908
	Afternoon2	490	38.0%	168	38.9%	658	38.2%	
	Night3	411	31.8%	138	31.9%	549	31.9%	
	Total	1291	100.0%	432	100.0%	1723	100.0%	
Type of referral	Self-referral	488	37.8%	302	69.9%	790	45.8%	<0.001*
	Primary care	557	43.1%	93	21.5%	650	37.7%	
	Others	246	19.1%	37	8.6%	283	16.4%	
	Total	1291	100.0%	432	100.0%	1723	100.0%	
Residence	Al-diwanyia	643	49.8%	262	60.6%	905	52.5%	<0.001*
	Other areas	648	50.2%	170	39.4%	818	47.5%	
	Total	1291	100.0%	432	100.0%	1723	100.0%	
Day of admission	Thursday-saturday	866	67.1%	304	70.4%	1170	67.9%	0.205
	sunday-wednesday	425	32.9%	128	29.6%	553	32.1%	
	Total	1291	100.0%	432	100.0%	1723	100.0%	
	Holdays	663	51.4%	287	66.4%	950	55.1%	<0.001*
	workdays	628	48.6%	145	33.6%	773	44.9%	
	Total	1291	100.0%	432	100.0%	1723	100.0%	
Treatment department	Pediatric medicine	1196	92.6%	426	98.6%	1622	94.1%	<0.001*
	Ped. Surgery	95	7.4%	6	1.4%	101	5.9%	
	Total	1291	100.0%	432	100.0%	1723	100.0%	
Type of admission	Routine	735	56.9%	273	63.2%	1008	58.5%	0.022
	Emergency	556	43.1%	159	36.8%	715	41.5%	
	Total	1291	100.0%	432	100.0%	1723	100.0%	

(1); 7:00am-1:69pm (2); 2:00pm -9:59pm (3); 10:00pm -6:59 am

The numbers of children admitted with every diagnosis are given in Table 2. With the identical number and rate of improper admission in every case.

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Rate of improper admissions was high, when the diagnosis was: diarrheal disease;80/244 (18.5%), seizures; 38/152 (8.8%), lower respiratory infections (acute bronchitis and pneumonia) 32/162 (7.4 %), acute vomiting; 35/84(8.1%),cardiovascular disease 24/57(5.6%), blood disorders 15/76 (3.5 %), poisoning 10/34(2.3%) , bronchial asthma 57/243(13.1 %) , neonatal jaundice 44/187 (10.2 %). The proportion of inappropriate admission was less when the diagnosis was: "acute upper respiratory infection" like acute pharyngitis, tonsillitis and laryngitis; 10/184 (2.3%), fever 30/102 (6.9 %), or urinary tract infection 20/70 (4.6%). Unspecified viral illness 20/69 (4.6 %), symptoms, signs and other unspecified 17/59 (3.9%).

Table 2: Distribution of Clinical Cases for all Admissions, and In Appropriate Admissions

Admissions cases	Inappropriate admission n (%)	All admissions n (%)
Gastroenteritis	80 (18.5%)	244 (14.2%)
Bronchial asthma	57 (13.1%)	243 (14.1%)
Neonatal jaundice	44 (10.2%)	187 (10.9%)
Seizures	38 (8.8%)	152 (8.8%)
Acute vomiting	35 (8.1%)	84 (4.9%)
Lower respiratory infections (acute bronchitis and pneumonia)	32 (7.4%)	162 (9.4%)
Fever	30 (6.9%)	102 (5.9%)
Cardiovascular disease	24 (5.6%)	57 (3.3%)
Urinary tract infection	20 (4.6%)	70 (4.06%)
Unspecified viral illness	20 (4.6%)	69 (4%)
Symptoms, signs and other unspecified	17 (3.9%)	59 (3.4%)
Blood disorders	15 (3.5%)	76 (4.4%)
Poisoning	10 (2.3%)	34 (1.9%)
Total	432(100%)	1723(100%)

IV. DISCUSSION

Superfluous patients admission in hospitals, are a problem for which good awareness has been paid in developed countries by doing broad researches regarding this matter 24.Unfortunately the officials of developing countries(including Iraq) are unaware of the problem, so need a lot of investigations to study the factors contributing to this problem25.

Unfortunately, there have been no previous study of admissions in Iraq "using an appropriately modified PAEP".

The inappropriate admission ratewasestimatedtobe25.1%inthe current study. Poureza estimated inappropriate admission 22.8% in two training hospitals in Tehran, Castaldi estimated it 31.5%, and Hatam estimated it22% in four hospitals in Shiraz. In appropriate admission rate is reported to be 55% in a pediatric hospital in Swedish, and 23% in another study in that country. The least percent of in appropriate admission was 4% reported in case of a military hospital in Turkey. The variation in inappropriate admission rates in these studies are significant ,which may be ascribed to distinct acknowledgment procedures, geographical locations, or bed occupation rates of the medical centers.

According to the finding of this study; 25.1%of all hospitalization, were recorded as in appropriate. This could be explained by many factors as:

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1. Lacking of adequate benefit in primary health centers and collection of means in hospitals, thus the parent of patients elects the hospital care, expressly during an acute disease, so precede to increase unsuitable admission.
2. Patients self- referral manner; in spite of the referral system is the usage in the Iraq health system but most people overlook it and they themselves insist to visit the hospital.
3. Avoidance of using out patients diagnostic facilities.
   4-some unsuitable admissions may interpret by the admission of interesting cases for teaching activities.
4. Absence of right outpatient examinations was the most vital consider included superfluous patient admissions.
5. Physician's preserver attitude and over-anxious has been referred to in the literature as another central agent affecting the unsuitable hospitalization. It is postulated that this problem is chiefly related to the lack of satisfactory training and suitable diagnostic tools, which could be improved by additional education courses and the provision of proper equipment.

In the current study, the unsuitable admissions were 22.2% among patients under one y. of age compared to 31.3% and 46.5% in children above one year of age and this could think the difference in the complexity of diagnoses between these two age groups(infants and older children) ($p<0.001$).

Younger small children are mostly admitted because of; prematurity, congenital-malformations, or sever infections, the conditions which need intensive care, whereas older children presented with more chronic-diseases and could be admitted for investigation, treatment, and less extensive intervention.

In the studies carried out by Pourreza and Hatam, no significant correlation between age of admitted patient and the unsuitable admissions rate was observed. In contrast, the correlation was found to be significant in studies by Carnessale and Attena and our study.

Moreover, relationships between gender and inappropriate access were studied. There was an important relation observed between the two factors in our study (63.0% female, 37.0% male), ($p<0.001$). And the same result was getting in studies conducted in Carnissale apposite to the studies by Poureza, Bakhtari, and Hatam whereas the correlation was found to be insignificant. This can be explained by the fact that the female patient more attending to or referred to the emergency unit than male patients. There was no variety (statistically not imperative) in the level of improper admissions at various circumstances of the day, inconsistent with the finding of other study, Bianco, Esmail, ($p=0.908$).

Regarding the style of referral, a majority of unsuitable admissions was self-referral instantly to casualty unit, with allow rate of inappropriate admission referring from the boundary (8.6%) and primary health centers (21.5%) this was significant ($p<0.001$). This finding may attribute to the easy access to the hospital without referral paper, the parental choice for hospital care, especially during an acute illness and nearly free of charge of health services.

In the current study, unsuitable admission was found to be significantly correlated to the city residence (AlDiwanyia) ($p<0.001$) more than other areas. These correlations were found to be trivial in studies achieve by Poureza, Bakhtari, Hatam, Carnessale, and Attena. We can interpret this result because of the proximity between the

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hospital and the city and the lack of need to travel, in addition to the ease of access of patients and their families to the hospital even without referral paper.

The present study was statistically not significant with the inappropriate admission care in days of week where high rate from Thursday to Saturday ($p=0.205$), while statistically significant with days of holidays ($p<0.001$), and this is because of the holidays in Iraq were Friday and Saturday, the absence of a specialist doctor, the weakness of the decision by the resident doctor and the most primary health centers were closed and not working on Friday all these factors contribute to increasing the inappropriateness.

This study show that the difference between improper hospitalization in various departments and type of admission (routine and emergency) were significant, ($p<0.001$) and ($p<0.022$) respectively, and the fact that those children were admitted to medical department (general pediatric & neonatal unit) tends to be higher than children whom hospitalized in surgery department and this is because of high number of children admitted to medical wards and limited surgical cases for operation where most of them diagnosed properly. This result apposite to the finding of other studies which achieved by "Celik et al" and "Martinez et al".

Gastroenteritis, bronchial asthma, neonatal jaundice, seizures, have a high rate of unsuitable admissions whereas blood disorders, acute pharyngitis, laryngitis, have a low rate and this may be due to the differing management capabilities and control level of outpatient department. Blood disorders and poisoning are less controlled in outpatient departments therefore admission are most appropriate.

V. CONCLUSION

Our findings clarify that the rate of improper admissions and hospitalization of children was higher in maternity and children's hospital in Diwaniyah(Iraq) and this might be a consideration of poor-supplement in the primary health center in Iraq, and because the health services in government hospitals are almost free and the patients usually prefer to review the hospital instead of the primary health centers because of weak services in these centers, inadequate work in referral system in most of the time.

To promote a good health care system and excellent utilization of resources, it is needful to get rid undue admissions and hospitalization's stay.

VI. RECOMMENDATION

In light of our finding, we believed that the rate of inappropriate admissions is elevated enough and consider as a problem in Pediatrics. Hospital costs aggravate with unsuitable hospitalization and such an excessively charged is anover on the patient, the hospital, economic burden on the healthcare framework, and have a stress effect on the children and their families.

Consequently, superfluous hospitalizations ought to be avoided. If the norm rules for admission are appropriately used, doctor will be able to minimize unsuitable admissions. So he will manage further patients and the expenditure and the load on the hospitals would be controlled to some-degree.34

To reduce needless admission the following points should be applied: 24

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1. Employ proper rules or a "modified Paediatric Appropriateness Evaluation Protocol" in the Iraq framework as a using review tool is possible, particularly in the hospital.
2. Expansion outpatient's diagnostic facilities and providing a proper, sufficient services to minimize needless referring to emergency and general pediatric department.[25]
3. Activating the role of primary health centers and providing them with medicines, equipment and laboratory analysis to treat patients and reduce their referrals to government hospitals.
4. Improving and emphasizes the achievement of the referral systems in order to decrease referral cases to hospitals [24].
5. To train doctors, especially those working in primary health centers, in order to increase their medical expertise in diagnosing and treating patients, thus reducing patient referrals to hospitals.
6. Building up an area of short perception in the casualty department which able to give i.e. fluids as well as the perception of the reaction to management of respiratory issues like; Bronchial asthma, and croup may likewise bring down number superfluous hospitalizations. It's conceivable that enhancing these things can make the average of pointless confirmations diminish, so we can give effective utilization of hospital assets.

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