



Research Article

## PEDIATRIC TRANSFERS TO THE TERTIARY LEVEL EMERGENCY DEPARTMENT EXPERIENCE OF THE IBNSINA HOSPITAL CENTER IN RABAT

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### ABSTRACT

**Introduction:** The transfer of pediatric emergencies can't be improvised, but it must be organized for coordinated, and/or fast, efficient and quality orientation. **The aim** of our research is to study the reasons for pediatric transfers to the pediatric medical emergency department of the children's hospital in Rabat and to specify the factors of the transfer justified and not justified. **Material and methods:** This was a prospective study of 329 patients transferred, with a period of 6 months, from 1 May to 31 October 2015. It concerned children between the ages of 0 and 15 transferred from other public and private care facilities admitted to the reception service for pediatric medical emergencies (PME). **Results:** An incidence rate of 1.33% with a peak during the month of June. Children over 2 years of age accounted for 40.7%, while newborns accounted for 36.8%. The sex ratio M / F was 1.57. Eighty per cent were referred from provincial hospitals (Level II). Otherwise, the region of Rabat, serving the children's hospital of Rabat (CHR), accounted for 49%. Transfers are unregulated in 95.7% of cases. The transfer decision was made by specialist doctors in 40.4% of cases, by general practitioners in 55.3%, influenced by the patient's family in 9% of cases. Transfer time was mentioned in 6% of cases. Patients were put in condition in 12.1% of cases, accompanied by a health professional in 7.6% of cases, through an ambulance in 38.9% of cases. Eighty-seven percent of transferred cases were admitted to the PMEs on working days of the week, of which 64.1% occurred outside normal working hours. Transfers were justifiable in 42.7% of cases, these patients were referred in 80% by the specialist for vital distress. Ten percent of the patients were hospitalized in the intensive care unit, 81% of cases were admitted to pediatric hospitalization of CHR, and 9% were referred for outpatient treatment. The main transmission pathologies encountered were infectious (37%), haematological (13.4%), respiratory (10.6%), neurological (9.4%), and accidental (6.7%). **Conclusion:** The pediatric transfer to the tertiary level emergency department must be justifiable in order to limit the cost of transport, intervention and accompaniment.

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### INTRODUCTION

In Morocco, hospitals are organized according to their scope and the level of services they offer, according to three levels. The University Hospital Center (UHC) is the third reference level, providing medical care that requires a high level of competence and appropriate advanced technology. Therefore, the transfer of a patient or injured admitted in emergency is regulated in Morocco by article 47 of the internal regulations of the hospitals 2010. The ultimate goal of the transfer is to ensure correct management of the transferred patients. An unjustified transfer is a transfer having allowed the transferred patient to receive at the hospital of the care that could have received to the referring hospital.

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The aim of our research is to study the reasons for pediatric transfers to the pediatric medical emergency department of the children's hospital in Rabat and to specify the factors of the transfer justified and not justified.

### MATERIAL AND METHODS

This was a prospective, descriptive study over a 6-month period from May 1 to October 31, 2015. The study looked at the description and analysis of the different transfers of urgent cases aged 0 to 15 years transferred from other public health structures (health center, local hospital, provincial hospital) and private, admitted to the reception service of pediatric medical emergencies (PME) of the children's hospital of Rabat (CHR). The CHR is one of the ten health facilities of the IbnSina Hospital Center (ISHC). It is an autonomous public institution under the tutelage of the Ministry of

Health.It offers specialized third-level services and is an integrated element in the provision of public health care, which mainly drains the region of Rabat-Sale-Zammour-Zaer (RSZZ). The relevance of transfers from pediatric emergencies to the Rabat ISHC was the dependent variable of the study. Independent variables in relation to care services were: availability of specialist doctors at the referral hospital, the involvement of specialist doctors in the decision-making of the transfer of emergencies, the absence of the specialty required in the hospital, the availability of biomedical equipment necessary for the diagnosis and / or treatment of medico-surgical emergencies at the referral hospital; coordination with the medical regulatory center, and availability of transfer criteria. The variable in relation to the patient was the influence of the child's family on the physician's decision. For each transfer admitted to the CHR, a grid of data collection was duly filled by the doctor of the PMU. The following items were detailed in the grid: Patient identification (age, sex, origin), time of transfer, time of admission to the emergency department, reason for transfer, profile of health personnel who made the transfer decision, influence of the family on the transfer decision, means of transport, condition of the patient before the transfer transfer, contact of the control center, patient becoming and transfer justified or not.

**RESULTS**

A total of 24,638 children were admitted to the PMU service during the study period. Three hundred and twenty-nine sick consultants were transfers, the incidence rate of references was 1.33% with a peak during the month of June. Children over 2 years of age accounted for 40.7%, while newborns accounted for 36.8%. Eighty per cent were referred from provincial hospitals (Level II). The region of RSZZ, being the service area of the CHR, accounted for 49% (Table 1). Transfers are unregulated in 95.7% of cases. The transfer decision was made by specialist physicians in 40.4% of cases, by general practitioners in 55.3%, influenced by the patient's family in 9% of cases. Transfer time was mentioned in 6% of cases.

**Table 1** Description of the study's population (n = 329)

	n	%
<b>Age</b>		
0 – 1 month	121	36,80
1 month – 2 years	74	22,50
2 – 15 years	134	40,70
<b>Sexe</b>		
Male	201	61
Female	128	39
<b>Region</b>		
Rabat	161	49
Others	168	51

The patients were put in condition in 12.1% of cases, accompanied by a health professional (nurse or midwife), in 7.6% of cases, through a public ambulance in 38.9% of cases. Eighty-seven percent of transferred cases were admitted to the PMU service on working days (from Monday to Friday) of the week, 64.1% of which occur outside normal working hours, given that the timetable adopted in public administrations is the continuous schedule which is from 8:30 am to 4:30 pm.

Transfers were justifiable in 42.7% of cases, transferred patients were received directly in the choking room for

respiratory distress in 60%, referred in 80% by the specialist (pediatrician or resuscitator). Ten percent of the patients were hospitalized in the resuscitation department, 81% of the cases were admitted to the pediatric hospital of the CHR, and 9% were referred for outpatient visits. The main pathologies encountered in our study were infectious (37%), haematological (13.4%), respiratory (10.6%), neurological (9.4%), and accidental (6.7%) (Table 2).

**Table 2** Analysis of transfer data

	n	%
<b>Profile of personnel who made the decision</b>		
general practitioner	182	55,3
specialists	133	40,4
nurse	14	4,3
<b>Regulated</b>		
YES	14	4,3
NO	315	95,7
<b>By ambulance</b>		
YES	128	38,9
NO	201	61,1
<b>Accompanied by a health staff</b>		
YES	25	7,6
NO	304	92,4
<b>pathology</b>		
infectious	122	37
Haematological	44	13,4
Respiratory	35	10,6
Neurological	31	9,4
accidental		
Toxic	9	2,7
Scorpion Stich	9	2,7
Bite of the Snake	3	0,9
Drowning	1	0,3
Cardiac	10	3,3
Nephrologic	11	3,3

**DISCUSSION**

In Morocco, the transfer of an emergency admitted patient or injured person is regulated by article 47 of the 2010 Hospitals' internal regulations [1] which stipulates: “when the emergency physician finds that a patient or an injured person requires urgent care in a discipline or technique that does not exist in the hospital, he provides first aid and orders the transfer of the patient to the institution appropriate to his state of health. The hospital director or his representative shall take all necessary measures to ensure that the patient or the injured person is directed in a secure manner to the facility. This transfer should be done through the Medical Regulatory Center when it exists. The administration of the hospital must inform the family of the transfer”. Article 65 of the 2010 Hospitals' Rules of Procedure explains the criteria and procedure for transferring a patient to another hospital: “In the absence of units which can adequately ensure the medical care of a patient and the state of health of the patient so requires, the medical practitioner shall issue a medical prescription for the transfer to the most appropriate public hospital structure or, if necessary, to one of the hospital centers set up under Law No. 37-80. The patient is transported by means of the hospital where he is staying or through a private ambulance, at the patient's expense. The patient should be assisted by a nursing staff of the hospital. The patient must be accompanied by a liaison sheet, his hospital file or, failing that, a clinical summary containing all the information necessary for the consultation or examination”.

The relevance of referrals in health services depends on factors related to practitioners, factors related to the care

system, and the influence of the patient or his / her family on the doctor's decision.

Our study has the advantage of being prospective but remains mono-centric, not comparative to another control period.

The bibliographical studies carried out on the issue of references have reported that the availability of technical and logistical means are important elements in the transfer decision. When they are lacking or are inadequate, the transfer of the patient to another structure is decided even if the management is a matter of local human skills and potential [2], in our study the absence of the technical platform in the referral hospital accounted for 37.7% of the reasons for the justifiable transfer, notably digestive and bronchial endoscopy, the scanner, a specialized laboratory for the reading of the medullogram and for immunological assessments. The availability of clear criteria and instructions defining patients requiring transfer to a higher level would be another factor influencing the reference decision. A working group of the Royal College Of Radiologist of Great Britain [3] described the improvements made through the adoption of instruction manuals in the use of the radiology service by general practitioners and medical specialists. The result was a 12% decrease in the total number of radiographs prescribed by these doctors. Communication and coordination between the different levels of recourse through the organization of periodic coordination meetings is an important step in a readjustment concerning the diagnosis and justified reference and allows the doctor to know the fate of the patients he has transferred to the next level so as to learn more about the conduits that it must adopt later. Pediatric transfer to the PMU was regulated only in 4.3%, the reason for which was an extraction of the foreign body by bronchoscopy in 4 children, specialized surgery in 2 newborns, and a therapeutic management of blood oncology for 8 patients, despite the introduction of the EMS. Lack of coordination with the regulatory center is an argument in favor of unjustified transfers. The emergency medical service (EMS), is a device ensuring the harmonization essential to the proper functioning of the management of the emergencies. According to the national emergency action plan 2012-2016 of the Moroccan Ministry of Health, there is a strengthening of medical-hospital emergencies through the establishment of 8 EMS or Centers for the regulation of medical calls; there is the operationalization of 15 (emergency medical and resuscitation service) EMRS, attached to functional EMS's and covering 13 Regions; there is standardization of access to resuscitation services at the level of the Regional Hospital Center; and the initiation of HéliSmur (helicopter healthcare medical transport) [4].

The pressure of the patient or his family could also influence the relevance of the transfers. An English study [5] investigated the importance of the pressures exerted on the transfer of 862 patients to 122 general practitioners: in 39% (n = 336) of the cases a patient pressure was perceived by the general practitioner. In our study, the decision was influenced by the patient's family in 9% of cases.

The importance of the skills of experience and the degree of clinical certainty in the transfer decision were studied by several authors. These authors point out that lack of competence can lead to too many references: In a study on the appropriateness of transfers, specialists in orthopedic

consultation in the District of Doncaster in Britain [6] found that 42.7% (n = 213) of references were probably or certainly not justified, it is also the conclusion of a study on the references for examination of the colon, the general practitioners very rarely made investigations sufficiently complete before to refer [7], leading to a high rate of unnecessary examinations. The experience and the degree of clinical certainty in the transfer decision taken by the authors [8] are factors influencing the transfer decision. The availability of the specialty or specialists is a factor influencing the transfer decision [9]. Transfers to PMUs were motivated by the unavailability of the specialist in the referral health facility at the time of the transfer in 60%, they are avoidable transfers, if there was a rigor in respect of the work schedules. The general practitioner has taken the decision to transfer 55.3%, these transfers can be prevented if the current regulations organizing the pediatric strain are applied given the preponderant role of pediatricians in the management of emergencies in the referral hospital. During the working days of the week, the service of the PMU received 87% of transferred cases which causes a congestion of the service of the PMU with waiting periods often very long.

Such congestion was noted even by the pediatric emergency department (PED) of the Laval University Hospital Center in Nice [10], it has many deleterious effects, for families as well as for health professionals: suffocating atmosphere, stress and anxiety of the parents. The current state of activity in the SAUPs is such that it is necessary to adapt, in particular by setting up consultation structures enabling them to be decoupled in order to maintain their proper functioning [11] by introducing a short circuit system with outsourced consultations being the creation of medical homes of pediatric guards near of the emergencies [12]. Pediatric medical transfers are intended for children suffering from obvious or potential vital distress or whose functional prognosis is seriously threatened [13]. Among the 329 cases transferred to PMUs, only 42.7% of transfers were justifiable. These justifiable transfers had a vital need for care at the pediatric and neonatal resuscitation service not available in the referral hospital, they were received directly in the warding room of the PMU service, the distress was respiratory in 60% of cases, referred by the specialist in 80% of cases, thus reflecting the severity of the transferred case prior to transport or aggravation of the patient's condition during transport; therefore, such a real statement must draw the attention of the Moroccan Ministry of Health officials to monitor and improve the quality of the process of transporting patients, especially the newborn. Ten per cent of the total number of referral patients were hospitalized in the CHR resuscitation department, and in the event of unavailability of this service, the other patients in vital distress are hospitalized in the pediatric hospitalization services of CHR.

In the study by Rajender *et al.* [14], the common reasons for transfers to pediatric emergency rooms at the third level were the need for specialized counseling or diagnostic explorations of higher levels of care for their patients, which correspond to our reasons for the transfer.

In general, transfers of newborns require more interventions and are accompanied by more complications than for other populations. In a current study of 295 neonatal transfers, 19.8% of newborns had to be intubated, compared with 7.5% of infants and 4.9% of children. In addition, almost half of the

complications suffered by newborns during transport were respiratory [15].

In a study of 346 neonatal transfers, 36% of newborns suffered an adverse reaction, of which 67% was due to human error, 21% to defective equipment and 9% to ambulance problems especially to hypothermia [16, 17]. It is recommended that the optimal neonatal transport team adopt a model of cooperative practice and be composed of a nurse paired with another nurse, an ambulance technician or a paramedic with skills in newborn or children.

Ideally, direct medical control is provided by a neonatologist experienced in transport medicine [16]. Newborn transport teams to neonatal and perinatal tertiary care centers should be specifically dedicated to transportation, be housed in a tertiary care hospital, and have skills in newborn care. [16].

A study by McPherson *et al.* [18] demonstrated a decline in pediatric deaths, which declined from 23% to 9% due to specialized transport teams. In order to reduce the number of unjustified transfers to the tertiary level and to ensure better management of emergencies, it is recommended that a national committee be set up to develop standards for emergency transfers, in order to reduce the number of unjustified transfers to the tertiary level and to ensure better management of emergencies, it is recommended that a national committee be set up to develop standards for emergency transfers, the organization of practical training days for doctors and nurses to be formalized within the framework of an agreement between the ISHC and the other hospitals, the revitalization of medical regulation, the application of the regulations in force concerning the on-call and penalty of medical specialists, and the elaboration of a referential of current pathologies inspired by the regional reference system and adapted to the local context.

## CONCLUSION

The medical transport of newborns, infants and children is not improvised, but it must be organized for coordinated, and/or fast, efficient and quality orientation.

### Author Contributions

All authors have read and approved the final version of the manuscript.

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