

BRIEF ORIGINAL

Pediatric televisits and telephone triage: impact on use of a hospital emergency department

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Objectives. To analyze the characteristics of remote telephone consultations (televisits) and triage of pediatric emergencies attended by the 24-hour emergency service of Catalonia (CatSalut Respon), and to describe the impact of televisits on callers' decisions about whether or not to come to the emergency department and their opinion of the call service.

Methods. Observational cross-sectional study. During the call, cases were classified according the Spanish and Andorran triage system. Patients who were sent to the hospital underwent triage again, and the 2 assigned triage levels were compared. The families were later called to check data and ask their opinion of the service. Sociodemographic and clinical data related to the cases were recorded.

Results. A total of 370 televisits were made. Most cases (300, 81%) were not emergencies. Seventy-five callers (20.3%) were advised to go to an emergency department. Fever ($P = .002$) and questions about medication ($P < .001$) were the problems significantly associated with nonurgent cases. Nearly 46% of the cases classified as serious during telephone triage were also considered serious when the child was brought to the emergency department. The rate of agreement between the 2 triage levels was moderate. Over half the parents stated they had intended to go to the hospital before calling the service; 46% changed their mind based on the call.

Conclusions. Fever and questions about medication were significantly associated with televisits for nonurgent cases. Nearly half the parents changed their mind about going to the emergency department after a televisit.

Keywords: Triage. Telephone triage. Remote consultation. Emergency health services. Pediatrics.

Impacto de las consultas y triajes telefónicos pediátricos en el uso del servicio de urgencias hospitalario

Objetivos. Analizar las características de las teleconsultas y triajes telefónicos pediátricos atendidos por CatSalut Respon y describir su impacto sobre la actitud y la decisión final de los padres-usuarios de acudir o no a urgencias.

Método. Estudio observacional transversal. Durante la teleconsulta los pacientes se clasificaron según los niveles del sistema español de triaje. Aquellos que fueron derivados a urgencias se volvieron a clasificar en el hospital, y se compararon los niveles de triaje. Posteriormente, se realizó una llamada de verificación. Se recogieron variables sociodemográficas y clínicas.

Resultados. Se analizaron 370 teleconsultas, fundamentalmente no urgentes ($n = 300$; 81%). Un 20,3% ($n = 75$) fueron derivadas a urgencias. La fiebre ($p = 0,002$) y las dudas de medicación ($p < 0,001$) fueron motivos significativos de teleconsulta no urgente. Casi un 46% de los casos con niveles de gravedad altos en el triaje de la llamada también fueron clasificados con niveles de gravedad altos en el triaje posterior realizado en el servicio de urgencias hospitalario, mostrando una concordancia moderada. Más del 50% de los padres tenían intención de acudir a urgencias antes de la teleconsulta y un 46% cambiaron de actitud tras realizar esta llamada.

Conclusiones. Fiebre y dudas de medicación fueron motivos estadísticamente significativos de teleconsulta no urgente. La consulta telefónica produjo un cambio de actitud en casi la mitad de los padres.

Palabras clave: Triage. Triage telefónico. Teleconsulta. Urgencias. Pediatría.

Introduction

The hospital emergency department (ED) is an area that sustains a high demand of healthcare. In Spain, EDs attended 27.6 million hospital emergencies in 2016¹. In Catalonia, 3,197,851 emergencies were attended in 2015 and 64.3% were classified with triage levels 4 or 5 according to the Andorrà Model of Triage/Spanish Triage System (MAT/SET), which means low

complexity². These EDs are often saturated. Some factors, such as the possible inadequacy of hospital visits, have been associated with this problem³. The increasing use of technology in e-health is part of the initiatives to adapt the influx to EDs.

In Catalonia, "061 CatSalut Respon" (CSR) attends to urgent and informative health telephone requests. The CSR is made up of nurses supported by doctors.

The objectives of this study were to analyse the cha-

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acteristics of the paediatric telephone consultations and triage attended by CSR, and to describe the impact of teleconsultation on the attitude and final decision of the parents-users whether or not to go to the ED.

Method

Cross-sectional observational study conducted between the CSR of the Catalan Medical Emergency System/Department of Health and the Sant Joan de Déu de Esplugues de Llobregat University Hospital (Barcelona, Spain), a highly complex centre of reference for the paediatric population of Catalonia.

All CSR users requiring advice on a health problem in paediatric patients (< 18 years old) within the area of influence of the Hospital de Sant Joan de Déu during 2017 and who had given informed consent by telephone were included consecutively. Consultations with language barrier communication difficulties during the call or patients who did not respond to the subsequent verification call were excluded.

Teleconsultations were classified according to the emergency level of the MAT/SET, being: 1 (resuscitation), 2 (emergency), 3 (urgency), 4 (less urgent) and 5 (non-emergency-banal)^{3,4}. At the hospital, children were also cared for by a triage nurse, who redetermined the triage level with the same MAT/SET system. The assignment of the same triage level in both services was considered concordant. Subsequently, 24-48 hours after the teleconsultation, a call was made to fill in data on the attitude of parents/guardians.

The variables collected through teleconsultation were: age, sex, reason for the call, symptoms, triage level, linguistic comprehension problems and derivation. In the ED they were: same clinical variables, triage and final resolution. The triage level variable was collected as ordinal according to MAT/SET categories. In the subsequent call, the following were collected: intention to visit the health centre before and after the appointment, level of compliance with the recommendations received, level of satisfaction with the telephone service and assessment of the degree of usefulness of the service. The variables of compliance, satisfaction and usefulness were measured using a Likert scale (0 to 5, with 0 being the minimum value and 5 being the maximum value).

Frequencies and absolute percentages were used to describe qualitative variables. Quantitative variables were described using mean, standard deviation (SD) and medians. For all tests, a p value of less than 0.05 was considered statistically significant. The statistical package SPSS (V 23) was used for the statistical analyses.

All participants provided their recorded informed consent by telephone.

Results

We analyzed 370 phone conversations. The mean age of the interlocutors was 36.6 (SD 7.0) years; 73.1%

were women (n = 260). The median age of the children was 5 (range 17) years and 47.4% (n = 175) were girls.

Most of the calls were made by the parents (n = 307; 82.5%). The main reasons for consultations were: fever (n = 85; 21.7%), pain (n = 76; 18.4%), doubts about medication (n = 57; 14.6%) and trauma (n = 44; 11.3%). Twenty-six teleconsultations (7.2%) were identified with comprehension problems, mostly attributed to the anxiety of the interlocutor (n = 12; 46.5%).

In telephone triage, most calls were considered level 5, non-urgent (n = 212; 57.3%), and level 4, less urgent (n = 88; 23.8%), these two levels representing 81% (n = 300) of the total. Only 3 (0.8%), 14 (3.8%) and 53 (14.3%) patients, respectively, were classified in the most severe levels of triage (1, 2 and 3).

Of these, 33 (44%) presented neurological symptoms, 13 (17.3%) trauma, 11 (14.6%) digestive symptoms, 8 (10.6%) possible poisonings and 10 (13.3%) possible infections. When comparing the most frequent symptoms that were a reason for teleconsultation, depending on the urgency of the call (triage levels 1, 2 and 3 vs. levels 4 and 5), we found that only fever and medication doubts were statistically significant reasons for non-urgent consultation (p = 0.002 and p < 0.001, respectively) (Table 1).

Out of the 75 recommended referrals, although only 37 (49.3%) went to the reference hospital on the same day, in 32 other cases (42.7%) the parents stated, through the subsequent telephone call, that they had transferred the child to a private hospital, and another 6 (8%) to a primary care centre. Of those patients who were followed in the reference ED, two children (5.4%) were classified with triage level 1 according to MAT/SET; 12 children with triage level 2 (32.4%); 12 more children with triage level 3 (32.4%), and 11 with triage level 4 (29.8%). None of the children referred to the ED by the CSR were classified with a triage level 5. Of these 37 patients, 75.7% (n = 28) were admitted to hospital, 12 of them undergoing surgery (42.9%).

Almost 46% of cases with higher levels of severity in the triage call were also classified with elevated levels of severity in the subsequent triage performed in the ED, showing a moderate concordance (kappa = 0.37).

A total of 57.4% (n = 166) of the parents intended to go to the ED before the teleconsultation and 46% (n = 131) reported a change of intention after the call. Seventy-six percent (n = 225) indicated a high level of compliance with the recommendations received. The level of satisfaction with the care received was high (4.8 out of 5) and 62.7% (n = 245) considered this telephone service to be very useful. Neither the level of compliance nor the level of satisfaction, nor the assessment of the usefulness of the service presented statistically significant differences depending on the level of telephone triage (Table 1).

Discussion

There is evidence that triage telephone consultation changes people's intention to frequent EDs, reducing

Table 1. Teleconsultation characteristics as a function of the MAT/SET triage level

Characteristics	Level of triage MAT/SET: 4-5 (n = 300)	Level of triage MAT/SET: 1-2-3 (n = 70)	p
Main reasons for teleconsultation-symptoms [n (%)]			
Fever	76 (25.3)	6 (8.6)	0.002
Pain	59 (19.7)	13 (18.6)	0.835
Doubts about medication	56 (18.7)	1 (1.4)	< 0.001
Trauma	33 (11)	10 (15.2)	0.440
Teleconsultations time zone [n (%)]			
Morning (8-15 h)	48 (21.4)	15 (26.8)	
Afternoon (16-21 h)	169 (75.4)	41 (73.2)	
Evening (22-7 h)	7 (3.1)	0	0.309
Users intending to go to an ED if they had not done teleconsultation [n (%)]			
	127 (54.5)	39 (69.3)	0.120
Degree of compliance with recommendations [mean (SD)] (n = 296)*			
	4.6 (1.1)	4.5 (1.2)	0.560
Degree of satisfaction with telephone attention [mean (SD)] (n = 291)*			
	4.8 (0.6)	4.8 (0.7)	0.570
Degree of usefulness of teleconsultation [mean (SD)] (n = 293)*			
	4.8 (0.6)	4.7 (0.4)	0.913

SD: standard deviation; MAT/SET: Model Andorrà de Triatge/Sistema Español de Triaje; ED: emergency department.

*The rating ranged from 0 -minimum value- to 5 -maximum value-.

attendance^{5,6}, as is also reflected in the results of this study. Reducing attendance is not the only contribution of teleconsultation to emergency care, since it improves morbidity in serious illnesses, contributes to the organisation of care⁷ and improves safety in decision-making by parents. It is considered a good health tool to provide information and knowledge^{8,9}, although for Murdoch et al.¹⁰, teleconsultation may increase doubts in decision-making.

Depending on the type of symptoms evaluated over the telephone, the symptomatology may be overvalued, and children over-triaged¹¹, or under-triaged, causing sub-triage¹². The absence of an internationally established consensus to validate triage systems does not favour a decrease in this variability¹³.

The cases of telephone overtriage identified in this study were probably due to the recommendation to go to the hospital because the primary care centre was out of hours at the moment of the teleconsultation. Discrepancies between triage have been identified in the literature. Gamst-Jensen et al.¹² stated that frequent telephone triage produced an underestimation of the level of severity of the children, and this was associated with a possible communicative inadequacy due to a poor description of the symptoms during the call. The variability in triage classification has been described as multifactorial. Recently, Gómez-Angelats et al.¹⁴ correlated the level of triage assignment with the nurse's professional profile and the number of triage performed by the nurse. Classification errors in telephone triage may depend on how or by whom this triage is valued, or on the standardisation or not of communication with the interlocutor¹¹, and are frequent in all levels of severity and age ranges¹⁵.

This study has limitations. The follow-up of children was carried out in a single centre, which prevented it from being conducted in those who were transferred to private hospitals or primary care centres; nor was the variability associated between symptomatology and over- or under-triages analysed, and due to the heterogeneity of teleconsultation services, the generalisation of results may be limited.

In conclusion, most telephone triage was classified as non-urgent and fever and medication doubts were the statistically significant reasons for non-urgent teleconsultation. The telephone consultation managed by expert nurses produced a change in attitude in almost half of the parents, who finally did not go to the ED.

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