

## One year experience at the Emergency Unit of the Children's Hospital of Parma

*Tommaso Giacalone\**, *Maurizio Vanelli*, *Chiara Zinelli\**, *Angomeh Ndongko\**, *Juliette Ndaka\**, *Annachiara Casadei\**, *Daniela Nicoli\** and *Paediatricians on duty at The Children's Hospital of Parma*<sup>(1)</sup>

\* Post-graduate Medical School of Paediatrics and Department of Paediatrics, University and General Hospital of Parma, Parma, Italy

**Abstract.** The objective of the study was to analyse the activity of the Paediatric Emergency Unit (PEU) of the Children's Hospital in Parma, Italy, in the first year of its functioning. To this aim, the child's chronological age, place of origin (town or province), ethnic group, cause of consultation, time and date of admission, diagnosis and final destination were retrospectively collected from the clinical notes of all children who attended PEU from 1st. 10.1998 to 30th. 09.1999. During the period of this study 8,564 medical consultations (57% of users were male) were carried out by the Paediatricians on duty in the EU of The Children's Hospital. The average age of the patients was  $3.9 \pm 3.5$  years. Only 7% of patients passed through the General Emergency Department of the same Hospital. The peak period of consultations was found to be in February. The number of daily attendances progressively increased from Monday to Sunday according to a  $r$  of 0.59 ( $p < 0.02$ ) with a peak during the weekend. The most frequent causes for attendance concerned infections in the upper respiratory tract (36%), gastroenteritis (22%) and injuries (12%). Attendance, consultation and discharge procedures were covered at an average interval of  $36.1 \pm 15.6$  minutes (median 30 min.). Seventy per cent of the patients were discharged, 56.7% were males. Fourteen per cent of the rest were admitted for a short period of observation in the beds of the PEU and 16% in beds of specialised wards in the PD. Eighty per cent of admissions at the PEU lasted less than 48 hours. The analysis of the data collected at the PEU of our PD during the first year of its activity highlights the huge amount of work carried out by the Paediatricians on duty. To solve the abnormal admittance to a PEU, a complete reorganization of the Family Paediatricians network has to be hoped for. Special attention must also be addressed to the users of a PEU in order to reduce their attendance. To reach this target a continuous health education and information program for the general population and first-time parents has to be planned. Beyond these considerations, there is not doubt that a PEU requires a specific medical and nursing staff in order to prevent the service becoming ineffective.

**Key words:** emergency, paediatrics, admission, attendance

### Introduction

Seventy per cent of Italian hospitals do not have a Paediatric Emergency Department (PED) and the services are covered by the Paediatricians on duty of the

Paediatric Department (PD) (1). According to recent data, the children attending the hospital are about 4 million per year in Italy and the attendance is increasing at an annual rate of 5-6% (2); but the real emergency cases seem to be only 2-3% (1). This large num-

(1) Aldo Agnetti, Anita Ammenti, Giorgio Benaglia, Patrizia Bertolini, Carlo Caffarelli, Carlo Capone, Nicola Carano, Giovanni Chiari, Gian Luigi de' Angelis, Alessandro De Fanti, Icilio Dodi, Lucia Ghizzoni, Gian Luigi Grzincich, Giovanna Pisi, Emanuela Sani, Cesare Terzi, Teresa Tondelli, Raffaele Virdis, Laura Zavota

ber of attendance may interfere with the regular functioning of a PD, over-burdening the Paediatricians on duty who have to attend out-patients 24 hours a day, in addition to the emergencies in the PD. The room of the Paediatrician on duty becomes in this way a veritable Paediatric Emergency-Unit (PEU) working just like a PED. However, compared with the PED, the PEU is not autonomous and does not have its own individual staff. In addition, some PEUs, just like a PED, have a few beds for a short clinical observation.

In the background of this *scenario*, we have analysed the activity of the PEU of our Department in the first year of its functioning.

## Material and Methods

The information on patients of the PEU of our Department concerned the first year of activity from 1<sup>st</sup> October 1998 to 30<sup>th</sup> September 1999 and it was retrospectively obtained from the clinical notes. Every child admitted to the PEU was first attended by a nurse who filled out a form detailing the vital parameters (heart beat, respiratory rate, body temperature, blood pressure), age, body weight and height. No triage was made. The child was directly examined by a Paediatrician on duty. At the end of the visit, the child was either discharged with a letter for the family physician or he/she was admitted to one of 6 beds adjoined to the PEU for a short observation period. More serious cases were directly admitted to beds in the appropriate specialized ward of the PD.

The following data was collected by two of the Authors (CZ and TG): the child's chronological age, place of origin (town or province), ethnic group, motive for consultation, time and day of admission, diagnosis, and destination.

For statistical analysis t-student, ANOVA, chi-square, Pearson-linear correlation tests were performed.

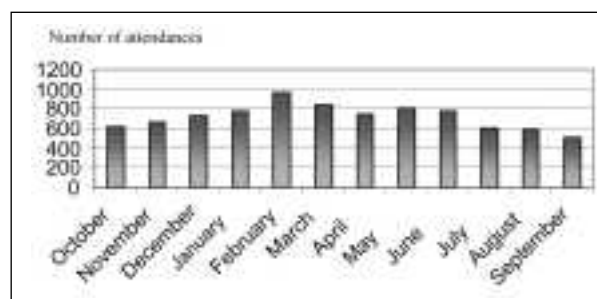
## Results

From 1<sup>st</sup> October 1998 to 30<sup>th</sup> September 1999 8,564 children attended our PEU. Fifty-seven per

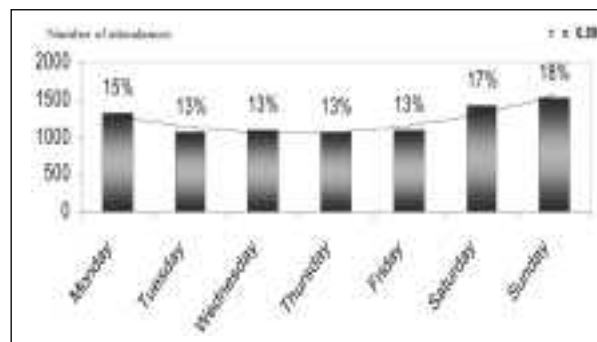
cent were males (males/females ratio 3:1). The average age was  $3.9 \pm 3.5$  years (range 1.2 months - 19 years). Eighty-seven per cent of the patients were Italian citizens and 13% belonged to an ethnic minority. Ninety-three per cent of the patients arrived directly in the PEU without passing through the General emergency department of the Hospital.

The attendance rate increased progressively from October with a peak in February and progressively decreased from March to September (Figure 1). The number of daily attendances increased from Monday to Sunday according to a  $r$  of 0.59 ( $p < 0.02$ ) with a peak during the weekend (Figure 2). The days with more stable attendance were Tuesday, Wednesday and Thursday. Fifty per cent of the total weekly admissions were observed between Saturday and Monday.

Patient attendance from 12 noon to 8.00 pm was 43%, from 8.00 pm to 8.00 am 35% and from 8.00 am



**Figure 1.** Number of monthly attendances at the Paediatric Emergency Unit of the Children's Hospital of Parma from October 1998 to September 1999



**Figure 2.** Number of daily attendances at the Paediatric Emergency Unit of the Children's Hospital of Parma from October 1998 to September 1999 calculated over a week.

to 12 noon 22%. Attendance originating from the ethnic minorities was stable during the working days, but increased significantly on Saturdays and Sundays ( $\chi^2=19.7$ ;  $p<0.003$ ) during which this attained the 49.8% of the total weekly medical consultations.

The most frequent reasons for consultation concerned infections of the upper respiratory tract (36%), gastroenteritis (22%) and injuries (12%).

Seventy per cent of patients were discharged, 56.7% were males. The average age was  $3.25\pm 3.1$  years (range 1 month - 19.5 years). Eighty-seven per cent of discharged children were Italian citizens; the remaining 13.0% were children belonging to an ethnic minority.

Admittance, medical consultation and discharge procedures were covered at an average interval of  $36.1\pm 15.6$  minutes (median 30 min) per child. Fifty per cent of services were supplied in less than 30 min ( $21.3\pm 7.9$  minutes).

Thirty per cent of patients were admitted: for a short period (16%), or a longer observation period (14%) in the beds of the PEU or in those of the PD respectively. The average age was  $4.3\pm 3.7$  years (range 1-18.5 years). Fifty per cent of the patients were 1 to 5 year old children. There was no difference between the two patient groups in average age or sex.

The most frequent reason for admission concerned gastrointestinal infections (30.2%), followed by injuries (16.6%) and infections of the upper respiratory tract (14.5%). The admissions due to an accidental poisoning at home were 0.6%. Most patients were admitted for no more than 48 hours (80%).

The town of origin of 3,886 patients (78.57%) was identified. Children coming from Parma-city were more numerous (43.2%) than those coming from the Province of Parma (35.3%); the percentage of children coming from the Provinces close to Parma was 21.5%.

## Discussion

The analysis of the data collected in the PEU of our PD during the first year of its activity highlights the huge amount of work carried out by the Paediatricians on duty. In 12 months, nearly 9,000 children with

a health problem attended this unit, that is six times the number of children admitted in our PD in the same period of time (Budget 1998). During this period of time, the Paediatrician on duty carried out an average of 25 consultations a day. This data is even more surprising if you consider that the Health Agency of Parma, working in the Province with an important Family Paediatricians network, guaranteed within the same period of time of present study at least eight hours of assistance per day, from Monday to Friday.

A dramatic increase in the daily work-load of both Paediatricians on duty and nurses working in a paediatric PEU is generally reported during the weekends (2), and on public holidays, when Family Paediatricians partially or totally ceased their activity. This situation was also observed in the area of Parma and turned the PEU of our PD (at least during weekend and holidays) into the only reference point for children with a health problem in the Province of Parma.

Several hypotheses may be put forward to explain this massive attendance at a PEU. The most likely one concerns the free facilities which a PEU offers to its users. An anxious parent may, in a few minutes, clear any doubts on the health of his/her child thanks to the network of services and competences existing within a Hospital. Another crucial point concerns the attendance at a PEU in order to bypass the long wait required for laboratory analysis, an X-ray or a consultation with a specialist. Several parents attend the PEU more simply because they are sure to find a Paediatrician at any time.

Several actions have been suggested in order to prevent the massive attendance in a PEU and this concerns the organization of a paediatric phone triage (6) or the payment of a ticket for non-urgent admissions (7). However, none of these seems to be effective in solving the problem. Whatever solution may be found, it is essential to reinforce the relationship between Family Paediatricians and their patients at least in our Country (7, 8). Twelve per cent of parents attending our PEU reported not to be convinced of the advice given by their Family Paediatrician.

To solve this abnormal situation, which also concerns several other areas in Italy (3), a complete reorganization of the Family Paediatricians network must be taken into consideration. In the first place, daily work-

ing-hours and prompt-availability of Family Paediatricians during the weekend and holiday time should be modified according to their patients demands. A few Family Paediatricians in Parma have already responded positively to these demands by joining their consultations in an associated bureau in order to assure their patients a continuous availability of at least one Paediatrician during the day, weekend excluded. A similar solution should be encouraged everywhere. The discussion on the probability of involving Family Paediatricians in the functioning of a PEU as physician on call is still unresolved, although this solution has already been successfully introduced in some areas (4).

All Authors agree that special attention must also be addressed to the users of a PEU in order to reduce their attendance. In our experience, at least 80-90% of attendances to the PEU were "subjective emergencies". This means that they could be treated at home by parents. To achieve this target in the future, a continuous health education and information program for the general population and first-time parents has to be planned (5). Mass-media could be useful to educate and to accustom the general population to use the public health services more rationally, but for first-time parents an important effort has to be asked for from both hospital nursing and medical staff during the pre-natal period, and Family Paediatricians after birth. Education programs need to be addressed particularly to the parents of children aged below 5 years of age, as these resulted as being the most frequent patients seeking consultation. Equally important is the education of parents on first aid training, recognition of signs and symptoms of a serious illness or a significant injury, and indications for seeking immediate care. The provision of printed handouts and standardized diagnosis-driven discharge instructions, along with verbal communication during "well child" or urgent care visits are also helpful mechanisms for informing parents which emergency situations may handled at home without attending a PEU (6).

Sixteen per cent of patients of our PEU were admitted for a short clinical observation. In 44% of them the stay in the PEU lasted 12 to 24hours and in 30% the admission was even shorter, 2 to 12 hours. The six beds attached to the PEU proved very useful in maintaining patients of dubious diagnosis under observa-

tion, giving the Paediatrician on duty the time and means to perform useful tests to make correct diagnosis as quickly as possible. Our experience on this subject was positive and proved that a PEU cannot work without a few beds. The availability of these beds allowed us to avoid those admissions needing less than one or two days to diagnose and treat an acute disease, and to leave available beds for more serious patients. Without a doubt, a PEU equipped with a few beds for brief clinical observations and provided with a specific medical and nursing staff will result in services that are highly effective.

## References

1. Giovannini G, Lambertini A, Giardina A. Il Pronto Soccorso pediatrico in Italia. *Riv Ital Ped (IJP)* 1998; 24: 129.
2. Amodio L, Tipo V, Vetrano F, Vitale A, Cardoni G, Magnani M, Messi G. Osservazione breve in pronto soccorso pediatrico: modelli organizzativi e budget. *Quaderni di Pediatria*, 58° Congresso nazionale italiano della Società italiana di Pediatria, Montecatini Terme 28 settembre-2 ottobre 2002. Pacinieditore 2002; vol 1: 6-9.
3. Messi G, Giuseppin I, Guglia E, Picciotti E, Magnani M, Cardoni G, Mazzoni N, Vetrano F, Vitale A. L'epidemiologia degli accessi pediatrici. *Quaderni di Pediatria*, 58° Congresso nazionale italiano della Società italiana di Pediatria, Montecatini Terme 28 settembre-2 ottobre 2002. Pacinieditore 2002; vol 1: 6-9.
4. Bollettino ufficiale della Regione Autonoma Trentino-Alto Adige. Deliberazione della Giunta provinciale. 24 novembre 1997, n. 6151: Approvazione dell' accordo a livello provinciale per la disciplina dei rapporti con imedici specialisti pediatri di libera scelta.
5. Monterisi N. Pronto Soccorso Pediatrico: problemi attuali. *Pediatria d'urgenza* 2001; 17: 23-30.
6. Brownstein DR, Rivara FP. Emergency medical services for children. In: Nelson textbook of pediatrics. Behram RE, Kliegman RM, Jenson HB eds, W.B. 16<sup>th</sup> edition. Saunders company, Philadelphia, 2000: 237-44.
7. Giardina A. Cultura pediatrica ed urgenza sanitaria ... oggi. *Pediatria d'urgenza* 1998; 11: 7-8

Received: 14 January 2003

Accepted after Revision: 20 February 2003

Correspondence: Prof. Maurizio Vanelli

Chair of Paediatrics, Post-graduate Medical School of Paediatrics,

Department of Paediatrics, Children's Hospital

University of Parma

v. le A. Gramsci, 14 - 43100 Parma, Italy

Tel/Fax: +39 0521702319

E-mail: vanelli@unipr.it