Retrospective Typology of Paediatric Emergency Visits in One-year: Sakarya/ Turkey

TM Alvur[1], N Cinar[2], D Kose[2], O Tiryaki[3]

ABSTRACT

Characterization of newborn (aged ≤ 28 days) visits to paediatric emergency department (PED). Retrospective study concerning newborns who presented to PED of Sakarya University Maternity and Pediatric Hospital during 2014. We studied the electronic data consisted of admission date, date-of-birth, emergency department diagnosis at discharge (ICD-10 code) and the outcome. A total of 5708 neonates visited PED with an average age of 7.9 ± 5.9 days of age and prevalence of males (56.1%). The major diagnoses were jaundice, respiratory system problems, excessive crying of infant, feeding problems of newborn and prematurity. Hospitalization was necessary for 35.9% neonates. There were 2912 neonates were between 0 and eight days of age. The major diagnoses of this group were jaundice, excessive crying of, feeding problems of newborn, upper respiratory infections, fever of newborn. Most of the neonates were discharged home from the PED (59.3%). Most PED visits were because of non-serious diseases, mainly because of insufficient briefing during discharge and limitations of primary care.

Keywords: Early discharge, emergency, hospital, newborn

From: [1]Department of Family Medicine, Kocaeli University Faculty of Medicine, Kocaeli, Turkey, [2]School of Health Sciences, Sakarya University, Sakarya, Turkey and [3]Neonatal Intensive Care Unit, Sakarya Maternity and Children's Hospital, Sakarya, Turkey.

Correspondence: Dr N Cinar, School of Health Sciences, Sakarya University, Esentepe Campüs, 54187Sakarya, Turkey. Phone : 0264 295 66 21, Fax: 0264 295 66 02
E-mail: ndede@sakarya.edu.tr

INTRODUCTION

In recent years combination of inpatient bed capacity, increasing fiscal restraints, psychosocial factors, and health considerations contributed to short postpartum hospital stays (1). In Turkey neonatal discharges in uncomplicated vaginal and abdominal deliveries are within 24 hours and 96 hours, respectively (2–4). Early neonatal discharges are examined in many perspectives (5), displayed conflicting outputs related to use of emergency departments or readmission (5): increased (6, 7), no change (8–11) and decreased (12). Paediatric emergency departments (PED) do not only serve for healthcare of the acutely ill paediatric age group but also are centres that provide vast amount of primary care, parental education and counselling (9). Very little data exist on spectrum and frequency of early neonatal visits to PED in the Turkish medical literature (2).

This retrospective study is designed to make a one-year documentation of paediatric emergency department (PED) admittance of neonates to Sakarya University Maternity and Paediatric Hospital Emergency Department.

MATERIALS AND METHODS

In this retrospective study we have collected data of neonates (0–28 days of age), who had record between 01/01/2014 and 01/01/2015, from the electronic data bank of Sakarya University Maternity and Pediatric Hospital after ethical approval of the research and receiving permission of the institution. These records consisted of admission date, date of birth, emergency department diagnosis at discharge (ICD-10 code) and the outcome. Sakarya University Maternity and Paediatric Hospital is one of the three main state/university hospitals of the Sakarya province that has 917 373 population and about 13 267 births (33 751 male, 31 881 female) in 2013 census.

Daytime visits are defined as “admittance between 08:00 and 16:00 hours”. The data were organized in SPSS database and statistical significance was set at 0.05.

RESULTS

In 2014 there were registers of 5767 neonates visiting PED; 5708 were included in the study; the other cases were excluded due to incomplete data. There were 3201 males (56.1%) and 2507 females (43.9%), representing a male-to-female ratio of 1.3:1. New-borns’ average age was 7.9 ± 5.9 days (median 7 days). The most represented months were July (12.1%), December (11.0%) and August (10.2%) [Figure 1]; 48.8% of the visits (n = 2787) were between 16:00 and 08:00 hours. Monday (n = 993, 17.4%) and Friday (n = 944, 16.5%) were the most intense days of the week.

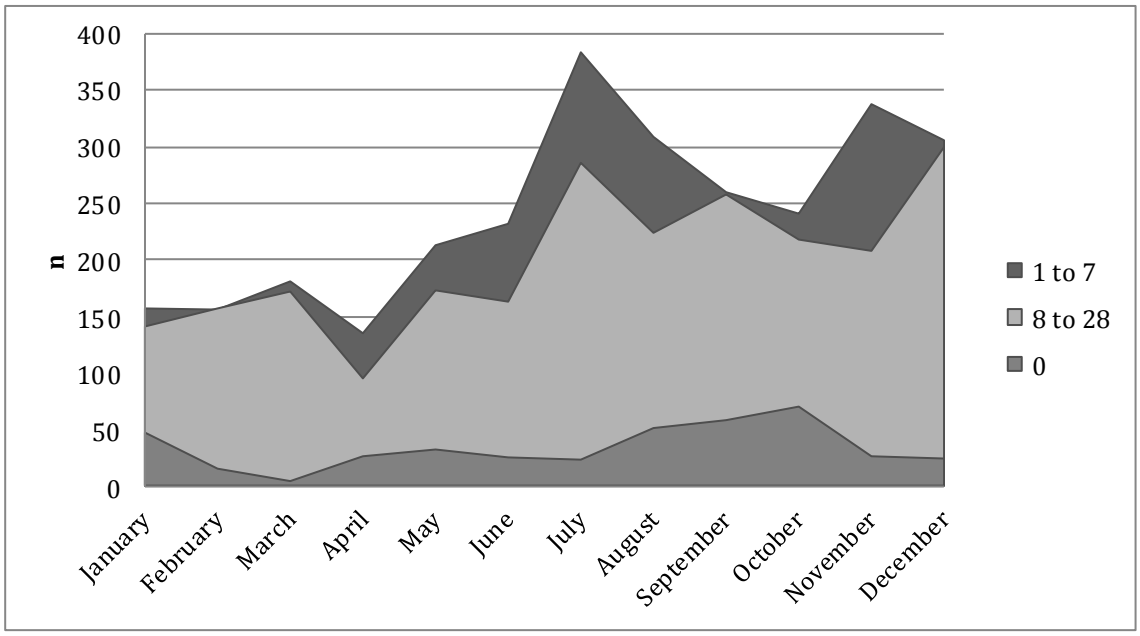

Fig.1: Distribution of visits to paediatric emergency department by months (n = 5708).

Table 1: Decisions at the emergency department and outcomes.

	Jaundice	**Respiratory system problems**	**Irritable infant**	**Feeding problems f newborn**	**Preterm infant**	**Total**
	n (%)	**n (%)**	**n (%)**	**n (%)**	**n (%)**	
Hospitalization	1052 (33.8)	331 (40.3)	10 (2.9)	172 (89.1)	172 (93.5)	1728 (37.2)
Care at the emergency department	2042 (65.6)	482 (58.6)	334 (97.1)	21 (10.9)	3 (1.6)	2881 (62.0)
Referral from the emergency department	5 (0.2)	0 (0)	0 (0)	0 (0)	0 (0)	5 (0.1)
Referral during hospitalization	8 (0.3)	8 (1.0)	0 (0)	0 (0)	9 (4.9)	25 0.5)
Exitus after hospitalization	0 (0)	1 (0.1)	0 (0)	0 (0)	0 (0)	1 (0.0)
Abstained treatment	5 (0.2)	0 (0)	0 (0)	0 (0)	0 (0)	5 (0.1)
Total	**3112 (100.0)**	**822 (100.0)**	**344 (100)**	**193 (100.0)**	**184 (100.0)**	**4645 (100.0)**

The most frequent diagnosis groups at the PED were neonatal jaundice (n = 3112, 54.5%), respiratory system problems (n = 822, 14.4%; 308 were upper respiratory infection), excessive crying of infant (n = 344, 6.0%), feeding problems of newborn (n = 192, 3.4%) and prematurity (n = 184, 3.2%) [Table 2].

Table 2: Duration of hospitalization according to diagnosis at discharge of pediatric emergency department.

	Duration of hospitalization, day				
	n	**Mean**	**SD**	**Minimum**	**Maximum**
Jaundice	1068	1.5	0.9	1	10
Respiratory System	341	3.7	3.0	1	13
Feeding problems of newborn	170	2.4	2.2	1	9
Preterm infant	183	7.5	5.2	1	22
Other disturbances of temperature regulation of newborn	116	2.7	1.9	1	9
Fever	24	2.5	1.9	1	7
Born outside hospital	21	2.2	0.7	1	3
Cardivascular System	20	9.7	6.9	1	20
Healthy	18	2.9	1.8	1	7
ENT*	13	58.9	32.5	2	76
Haemorrhage	11	2.0	0.8	1	3
Irritable infant	10	1.3	0.5	1	2
Omphalitis of newborn with or without mild haemorrhage	9	3.8	3.1	1	7
Soft Tissue /Skin	9	3.5	1.6	1	5
Hypoglycaemia/ Syndrome of infant of a diabetic mother	8	3.3	1.0	2	4
Reproductive/Urinary System	8	1.0	0.0	1	1
Neoplasm of uncertain or unknown behaviour of digestive organs	7	38.0	0.0	38	38
Digestive System	7	1.3	0.5	1	2
Nausea and vomiting	4	1.0	0.0	1	1
Convulsions of newborn	3	2.0	0.0	2	2
Total	**2050**	**3.2**	**6.3**	**1**	**76**

Hospitalization was necessary for 2050 (35.9%) neonates. The leading diagnoses for hospitalization were jaundice (n = 1068), respiratory system problems (n = 341), prematurity

(n = 183), feeding problems of new-born (n = 170) and disturbance of temperature regulation of new-born [n = 116] (Table 3).

Table 3: Emergency department decision and age distrbution.

Decision at the emergency department	Age at admission, day					Total
	0	1-7	8-14	15-21	22-28	
Hospitalization	376	1145	294	130	36	1981
	18.9%	57.8%	14.8%	6.6%	1.8%	100%
Care at the emergency department	10	1726	1261	513	158	3668
	0.3%	47.1%	34.4%	13.9%	4.3%	100%
Referral from the emergency department	0	5	1	0	0	6
	0%	83.3%	16.7%	0%	0%	100%
Referral after hospitalization	14	14	2	0	0	30
	46.7%	46.7%	6.7%	0%	0%	100%
Exitus after hospitalization	1	16	0	0	0	17
	5.9%	94.1%	0%	0%	0%	100%
Abstained treatment	0	6	0	0	0	6
	0%	100%	0%	0%	0%	100%
Total	401	2912	1558	643	194	5708
	7.0%	51.0%	27.3%	11.3%	3.4%	100%

Median duration of hospitalization was two days (range 1 day to 75 days). The longest hospitalization periods were due to cleft palate; 10 cases stayed at the hospital for 75 days, each. There were 3658 admissions that didn't end with hospitalization; seven of them were referred to another institution. Most of the hospitalized patients were discharged with a decision of "recovery/cure" (n = 1935, 94.4%), 54 (26.%) new-borns were discharged

with improvement, 29 (1.4%) were referred to another institution, nine (0.4%) were discharged as is, six new-borns' (0.3%) legal guardians abstained treatment (Table 4).

Table 4: Day zero admission charecteristics.

		n	%
Gender	**Female**	258	64.3
	Male	143	35.7
Diagones; ICD code	**Frequency**		**Per cent**
Preterm infants >28 weeks and <37 weeks; P07.3.1	146		36.41
Respiratory distress of newborn, Respiratory failure, Transient tachipneaof newborn; P22.8, P22.0, P28.5, J96.9; P22.9, P22.1	137		34.16
Feeding problem of newborn, Vomiting in newborn; P92.9, P92.0	17		4.24
Singleton, born outside hospital, Singleton, unspecified as to place of birth, Outcome of delivery; Z38.1, Z38.2, Z37.9.2	22		5.49
Neonatal aspiration of meconium; P24.0	14		3.49
Physiological jaundice-newborn, Neonatal jaundice; P59.9, P59.8	17		4.24
Cleft palate; Q35.9	10		2.49
High risk infant; Z76.2	6		1.50
Disease of upper respiratory tract; J39.9	5		1.25
Syndrome of infant of a diabetic mother; P70.1	5		1.25
Choanal atresia; Q30.0	4		1.00
Hypoglycemia; E16.2	3		0.75
Infected respiratory tract; J98.8	3		0.75
Neonatal aspiration syndrome; P24.8	3		0.75
Neonatal hypertension; P29.2	3		0.75
Pneumothorax; J93.9	2		0.50
Meconium plug syndrome; P76.0	2		0.50
Asphyxia; R09.0	1		0.25
Fever, unknown origin; R50.9	1		0.25
TOTAL	**401**		**100**

Seventeen hospitalized newborns (0.8%) passed on (Seven cases were coded D37.7 = Neoplasm of uncertain or unknown behaviour: other digestive organs; nine cases were coded R09.0 = Cardiomyopathy, unspecified; one case of I42.9 = Asphyxia).

0 day old cases

There were 401 zero day old newborn admissions. Legislation in force about the social insurance covers the newborn and the mother jointly. In order to prepare a medical record card for the newborn and/or any medical intervention the newborn is registered at the pediatric emergency department. We prefer to present these data separately (Table 4). There were 258 (64.3%) females. Most frequent admissions were in October (n = 70; 17.5%), on Fridays (n = 87; 21.7%) and between 16:00 and 8:00 hours (n = 232; 57.9%). most frequent diagnosis was prematurity (n = 146; 36.4%). Only 10 (2.5%) newborns were handled at the PED, one newborn was diagnosed with asphyxia passed away three days after hospitalization.

1–7 days old cases

There were 2912 neonates in this age group (female: 1249, 42.9%; male:1663, 57.1%). The most represented month was July (n = 384; 13.2%). Most of the admissions were made on Mondays (n = 538; 18.5%) and Fridays (n = 445; 15.3%) during the daytime (n = 1505; 51.7%). Top five diagnoses were jaundice (n = 2056; 70.6%), excessive crying of infant (n = 144; 4.9%), feeding problems of newborn (n = 107; 3.7%), upper respiratory infections (n = 93; 3.2%), fever of newborn (n = 59; 2.0%).

DISCUSSION

The national law ensures access to emergency department care in Turkey. Emergency department physicians must examine all people who seek care, regardless of their income status, ethnicity, insurance status or special needs. The policy is that emergency care is patient-demanded, and a patient visiting emergency department is seriously ill until proven otherwise. Attendance to research and training hospitals' PEDs and state universities' PEDs are free of charge in Turkey, the service is 24 hours / 7 days. In Turkish medical literature the visits to PED by neonates are not documented, therefore we cannot make any comparisons.

The appraisals of neonatal emergency admissions need to take account particular conditions like fragility and variability of physiologic characteristics of neonatal period. Besides there are issues related to the caretakers like anxiety, overprotection and lack of knowledge about nurture. These are the probable facilitators of PEDs. In our study the dominant number of PED visits in the first seven days of life (58%) highlights the motives of presentation are mostly related to intercurrent perinatal problems. Sixty-four per cent of neonates were discharged home from the PED. Top three diagnoses (jaundice, respiratory system problems and irritable infant) accounted for 75% (n = 4645) of our study population and 66.8% (n = 66.8%) of them were not hospitalized. In their study Akin *et al* reported neonatal jaundice frequency as 87%. Although 97% of women is literate in this region of Turkey (13), the inadequate knowledge about neonatal care can be due to poor support and education during pregnancy and post partum period (14–16), short postpartum hospital stay (3) and shortness of primary health centres. Short postpartum hospital stays requires education of parents about the care of the infant but Diekema *et al* found that "improved parental education alone may not decrease ED use for conditions that could be managed in a less costly setting" (17). Besides, being "fearful" changes health related behaviour (18).

In 2005, Turkish Ministry of Health started a new healthcare service delivery named as "Family Medicine". In this system physicians without any specialization (94.5%) and/or specialist of any discipline work as "contract family physicians" after compliance training that last for ten day. The number of family medicine specialists in this system is very low – about 5%. Every "family physician" has about 4000 registered population (19) serves free of charge for the family. The patient has a freedom to choose care provider and there is no gatekeeping system or financial penalty system for emergency department visits. There are 254 family health units in Sakarya responsible of all first-line care of their registered population. The first-line care for newborns and the mothers during puerperal period are under the responsibility of their family doctors and are charged with negative performance on omission. There are studies that report low follow-up rates of confined women and their babies (15, 16, 19). In "2013 Turkish Republic Ministry of Health, Health Statistics Report", maternal and neonatal mean follow-ups during puerperal period were 2.9 and 8.8, respectively (20). On the other hand, emergency departments (ED) and emergency health services are also mainly dependent on general practitioners.

We have shown that many visits were non-urgent and caretakers prefer to seek care from PED rather than primary care physician even during the "open" hours. Non-urgent visits / overcrowded EDs have negative consequences: longer waiting periods, low patient and personnel satisfaction and higher costs. Yoffe *et al* in their educational intervention study, found substantial reduction in non-urgent PED visits (21). Introducing a financial penalty/out-of-pocket expenditure to non-urgent visits and/or gatekeeping system may reduce burden at PEDs but for this we have to assure parents to have enough knowledge to make this distinction and arrange walk-in visits for these cases. Focusing on parents' health literacy (22–27) and providing enhanced, coordinated, primary care access have significant effectiveness in utilization of the ED (28–31).

Strengths and limitations of the study

To our knowledge this is the first study to measure non-urgent utilization of paediatric emergency department in Turkey and have one-year design. The results of this study could be used to improve the quality of newborn care. Retrospective design of the study caused some hardship; data lack caretakers' age, education level, cause of admission. All patients who were discharged home from the PED were accepted non-urgent. The diagnoses coded in ICD 10 and vague diagnoses (Acute upper respiratory infection, unspecified; Feeding problem of newborn, unspecified *etc*) were substantial.

CONCLUSIONS

There is vast amount of non-urgent PED visits that necessitate some measures to be taken by the authorities. This issue needs more researches for supporting decision-making.

Conflict of Interest

The authors declare that they have no competing interests.

REFERENCES

1. Golbaşı Z. Early Postpartum Discharge Home Care Services and Nursing. Cumhuriyet Üniversitesi Hemşirelik Yüksekokulu Derg 2003; **7:** 15–22.
2. Akın MA, Kavuncuoğlu S, Özbek S, Aldemir EY, Uysal F, Güler S et al. Reasons and results of rehospitalisation of early discharged newborns. Türk Pediatri Arş 2006; **41:** 201–07.
3. Beydag KD. Adaptation to Motherhood in the Postpartum Period and the Nurse's Role. TAF Prev Med Bull 2007; **6:** 479–84.
4. Duman NB. Home Care after Pospartum Early Discharge. TAF Prev Med Bull 2009; **8:** 83–92.
5. Bravo P, Uribe C, Contreras A. Early postnatal hospital discharge: the consequences of reducing length of stay for women and newborns. Rev Esc Enferm U P 2011; **45:** 758–63.
6. Mandl KD, Brennan TA, Wise PH, Tronick EZ, Homer CJ. Maternal and infant health: effects of moderate reductions in postpartum length of stay. Arch Pediatr Adolesc Med 1997; **151:** 915–21.
7. Kennedy TJT, Purcell LK, LeBlanc JC, Jangaard KA. Emergency department use by infants less than 14 days of age. Pediatr Emerg Care 2004; **20:** 437–42.
8. Kotagal UR, Atherton HD, Bragg E, Lippert C, Donovan EF, Perlstein PH. Use of hospital-based services in the first three months of life: impact of an early discharge program. J Pediatr 1997; **130:** 250–56.
9. Sacchetti AD, Gerardi M, Sawchuk P, Bihl I. Boomerang babies: emergency department utilization by early discharge neonates. Pediatr Emerg Care 1997; **13:** 365–68.

10. Danielsen B, Castles AG, Damberg CL, Gould JB. Newborn discharge timing and readmissions: California, 1992-1995. Pediatrics 2000; **106:** 31–9.

11. Millar KR, Gloor JE, Wellington N, Joubert GI. Early neonatal presentations to the pediatric emergency department. Pediatr Emerg Care 2000; **16:** 145–50.

12. Cooper WO, Atherton HD, Kahana M, Kotagal UR. Increased incidence of severe breastfeeding malnutrition and hypernatremia in a metropolitan area. Pediatrics 1995; **96:** 957–60.

13. Hacettepe University Institute of Population Studies (2014), "2013 Turkey Demographic and Health Survey". Hacettepe University Institute of Population Studies, T.R. Ministry of Development and TÜBİTAK, Ankara, Turkey.

14. Sözeri C, Cevahir R, Şahin S, Semiz O. The knowledge and attitudes of pregnant women about pregnancy period. Fırat Sağlık Hizmetleri Derg 2006; **1:** 92–104.

15. Beser E, Ergin F, Sönmez A. Aydın il merkezinde doğum öncesi bakım hizmetleri. TSK Koruyucu Hekim Bül 2007; **6:** 137–41.

16. Durusoy R, Davas A, Ergin I, Hassoy H, Tanık FA. Prenatal care utilization from family physicians: a study among pregnant women applying to secondary and tertiary care hospitals in Izmir. Turk J Public Health 2011; **9:**1–15.

17. Diekema DS, Del Beccaro MA, Cummings P, Quan L. Physician parents and utilization of a pediatric emergency department. Pediatr Emerg Care 1996; **12:** 400–03.

18. Langer T, Pfeifer M, Soenmez A, Tarhan B, Jeschke E, Ostermann T. Fearful or functional--a cross-sectional survey of the concepts of childhood fever among German and Turkish mothers in Germany. BMC Pediatr 2011; **11:** 41.

19. Nesanır N, Erkman N. Evaluation of This Process on Healt Indicators of 11 Provinces Practicing Model of Family Medicine Firstly. TAF Prev Med Bull 2010; **9:** 493–504

20. Köse MR, Bora Başara B, Güler C, Yentür GK. *T.C.* Sağlık Bakanlığı Sağlık İstatistikleri Yıllığı, 2013. Ankara: Sentez Matbaacılık ve Yayıncılık, ANKARA; 2014.http://sbu.saglik.gov.tr/Ekutuphane/kitaplar/sağlık%20istatistik%20yıllığı%202013.pdf. Accessed February 13, 2015.

21. Yoffe SJ, Moore RW, Gibson JO, Dadfar NM, McKay RL, McClellan DA et al. A reduction in emergency department use by children from a parent educational intervention. Fam Med 2011; **43:** 106–11.

22. Herman AD, Mayer GG. Reducing the use of emergency medical resources among Head Start families: a pilot study. J Community Health 2004; **29:**197–208.

23. Herman A, Jackson P. Empowering low-income parents with skills to reduce excess pediatric emergency room and clinic visits through a tailored low literacy training intervention. J Health Commun 2010; **15:** 895–910.

24. Herndon JB, Chaney M, Carden D. Health literacy and emergency department outcomes: a systematic review. Ann Emerg Med 2011; 57: 334–45. doi:10.1016/j.annemergmed.2010.08.035.

25. Kubicek K, Liu D, Beaudin C, Supan J, Weiss G, Lu Y et al. A profile of nonurgent emergency department use in an urban pediatric hospital. Pediatr Emerg Care 2012; **28:** 977–84.

26. Morrison AK, Myrvik MP, Brousseau DC, Hoffmann RG, Stanley RM. The relationship between parent health literacy and pediatric emergency department utilization: a systematic review. Acad Pediatr 2013; **13:** 421–29. doi:10.1016/j.acap.2013.03.001.

27. Morrison AK, Schapira MM, Gorelick MH, Hoffmann RG, Brousseau DC. Low caregiver health literacy is associated with higher pediatric emergency department use and nonurgent visits. Acad Pediatr 2014; **14:** 309–14.

28. Wang C, Villar ME, Mulligan DA, Hansen T. Cost and utilization analysis of a pediatric emergency department diversion project. Pediatrics. 2005; **116:** 1075–79.

29. Haltiwanger KA, Pines JM, Martin ML. The pediatric emergency department: a substitute for primary care? Calif J Emerg Med Calif Chapter Am Acad Emerg Med 2006; **7:** 26–30.

30. Berry A, Brousseau D, Brotanek JM, Tomany-Korman S, Flores G. Why do parents bring children to the emergency department for nonurgent conditions? A qualitative study. Ambul Pediatr Off J Ambul Pediatr Assoc 2008; **8:** 360–67.

31. Carret MLV, Fassa ACG, Domingues MR. Inappropriate use of emergency services: a systematic review of prevalence and associated factors. Cad Saúde Pública 2009; **25:** 7–28.