

Profile of spontaneous demand for services among infants younger than 30 days old at a children's tertiary care hospital

Soledad Arbio, M.D.^a, Nicolás Brunner, M.D.^b, Eugenio Pierro, M.D.^c,
Susana Rodríguez, M.D.^d and Diana Fariña, M.D.^a

ABSTRACT

In recent years, admission of critical newborn infants (NBIs) to the neonatal intensive care unit of Hospital Garrahan (HG) has been limited due to the hospitalization of infants younger than 30 days old through spontaneous demand for services. This is probably a multifactorial situation, and one of its causes is a lack of regionalization, which results in an inadequate use of resources or a distorted use of resources intended for more complex care.

The *objective* of this study was to establish the profile of NBIs who make a spontaneous demand for services at HG and to assess the level of care required based on their medical condition.

Material and methods. Cross-sectional study. All infants ≤ 30 days old who sought care at HG in a period of 12 months were assessed. The analysis included clinical characteristics of NBIs, prior visits, parental reason for consultation at HG, and whether NBIs could have been seen at a primary or secondary care facility.

Results. A total of 307 consultations were analyzed; NBI age was 18 days \pm 7.6. Of these, 78% required hospitalization. The most common reason for hospitalization was acute respiratory tract infection. Thirty-five percent had health insurance coverage; 54% had sought care more than once at a different facility. Only 15% of NBIs had a highly complex condition that should have actually been solved at HG.

Conclusion. Based on the analysis of NBIs seen at HG through spontaneous demand for services, a high requirement of hospitalization for low and medium complexity pathologies was observed.

Key words: newborn infant, critical care, neonatal intensive care, children's hospitals.

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- a. Neonatal Intensive Care Unit.
 - b. Division of Neonatology.
 - c. General practice offices.
 - d. Department of Research and Teaching.
- Hospital de Pediatría "Prof. Dr. Juan P. Garrahan",
Autonomous City of Buenos Aires,
Argentina.

E-mail address:
Soledad Arbio, M.D.:
marisolarbio@gmail.com

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INTRODUCTION

Regionalization is a process in which a health care system is established in an increasing complexity order so that providers may meet the population's health care needs in a coordinated manner.^{1,2} Such system should provide adequate primary care and provide patients with a setting where they could have health checkups or probably be hospitalized, provide an optimal communication system that promotes the flow of information about care needs, and include an organized, centralized system for patient transfer. This occurs within the framework of agreements made among health care facilities and teams.³ However, in Argentina, perinatal service regionalization is a policy with varied implementation levels.⁴ It has been clearly established in several provinces, but it is still underway in the province of Buenos Aires and in the Autonomous City of Buenos Aires.² As a result, it is not uncommon for parents to decide where to receive antenatal care, where to deliver their baby, where the baby will receive primary health care (PHC), and where to seek care in case of a concurrent condition.

The neonatal intensive care unit (NICU) of Hospital Garrahan (HG) was founded in 1988 to cater for newborn infants (NBIs) referred from maternity centers with highly complex conditions that could not be solved at their place of birth.

Although patient admission should be mainly the result of referrals agreed among health care providers and scheduled based on priorities, HG offers both scheduled and walk-in appointments, and has outpatient offices and an emergency department.

In recent years, the proportion of patients ≤ 30 days old admitted to the NICU through spontaneous demand for services has increased progressively, from 33% of all admissions in 2004 to 45% in 2011 (HG data from 2011).

Within this context, in which spontaneous demand and scheduled referrals from other health care facilities struggle for a bed in the NICU, it is common to see that the system's effectiveness and compliance with the primary goals of creating a tertiary care neonatal unit are at stake.

The objective of this study was to establish the profile of NBIs who seek care at HG spontaneously and to assess the level of care required based on their medical condition.

POPULATION AND METHODS

Site: HG, in the period between July 1st, 2012 and June 30th, 2013.

Design: Cross-sectional study.

Population: The study included every consultation made by patients ≤ 30 days old at the emergency department or the Pediatrics outpatient offices.

Exclusion criteria: Visits made by patients receiving follow-up care at HG.

For each consultation, the investigator in charge (SA) completed a specially designed form and administered a questionnaire to the family, who gave their informed consent to participate.

Recruitment: From 8 am through 4 pm, all parents of infants ≤ 30 days old who sought care at the emergency department, either for low or medium risk pathology, were interviewed by the investigator in charge (SA). Each day on duty, there was a person in charge to care for patients who did not require hospitalization. The parents of patients admitted to the Division of Neonatology were interviewed by SA within the 48 hours of admission.

For each patient, the following data were collected: age in days old, reason for consultation, days since the present condition had started, need for consultation with a specialist, hospitalization requirement, hospitalization area (intensive care, intermediate care, low risk), length of stay, and clinical course.

The following outcome measures were defined:

- Referral from the maternity center where the patient was born to a PHC center (PHCC) for a health checkup or treatment of a concurrent condition.

- Analysis of availability of health care services near the patient's home. Parents were asked if they knew the closest health care facilities and whether any of those was used as their PHCC.
- History of visits to other health care facilities before seeking care at HG for the present condition. History of visits was identified based on the number of visits made in a specific timeline.
- Parental reasons to seek care at HG. The following list of predetermined reasons was used: experience with another child, delays in care, geographic proximity, referral from other health care provider, mistrust of a previous health care facility, lack of response at the closest health care facility, other reason, or open-ended response.
- Consultation/complexity adequacy: lack of adequacy was defined for those consultations that could have been solved at a primary or secondary care facility (patients who, based on their low complexity or not critical condition, did not require the hospital's technological capacity or specialists to manage their present condition). On the contrary, positive adequacy was defined for those consultations that required tertiary care, vital support, and hospitalization in the emergency area, and those whose underlying condition required management by two or more specialists or had two or more associated conditions. Based on these definitions, cases were presented independently to three experts, external to the study, who classified the consultation/complexity adequacy.

Analysis schedule: Data were entered into an Excel-like spreadsheet for analysis. Descriptive statistics were used to summarize collected data as mean, median, dispersion measures, ranges, and rates using percentages and charts. Associations with adequacy or lack of adequacy were explored as a dependent outcome measure based on the patient's factors or the context, using contingency tables. The statistical software package used was STATA 10.

The study was submitted and approved by the Review Committee and the Ethics Committee of the hospital.

RESULTS

A total of 709 patients were admitted to the NICU of HG during the study period; 43% (304/709) were hospitalized after seeking care

spontaneously. In addition, 307 infants ≤ 30 days made a spontaneous demand for services in the study year. Of these, 78% (240/307) required hospitalization; the conditions of 67 NBIs were solved in the outpatient offices. All patients agreed to participate in the study. *Table 1* describes the characteristics of this population.

The main diagnoses that led to the spontaneous demand for services are listed in *Table 2*.

Acute lower respiratory tract infections and infectious diseases (fever without a source: 25%, urinary tract infection: 15%, etc.) accounted for 48% of consultations.

Once the history of hospital visits made by parents prior to seeking care at HG was analyzed, it was observed that 54% made at least one prior consultation.

In terms of the reasons parents had to seek care at HG, 41% of consultations were the result of mistrust of the previous health care facility where they had sought care for their child. This was followed by referral from other health care provider (24%). Also, 16% of parents turned to HG because of a lack of response from the previous health care facility, and 8% had attended HG before with another child.

Among all patients informally referred to HG by other health care provider, 29% required hospitalization in our unit. None of these hospitalized patients was transferred to HG through a formal referral system, which should have included a physician, a transfer nurse,

TABLE 1. Characteristics of the population

| | N= 307 |
|---|-----------|
| Female, n (%) | 172 (56%) |
| Age (days old)* | 18 ± 7,6 |
| Health insurance coverage, n (%) | 107 (35%) |
| Place of origin, n (%) | |
| Greater Buenos Aires | 230 (75%) |
| CABA | 77 (25%) |
| Referral, n (%) | 270 (88%) |
| Prior health checkup, n (%) | 215 (70%) |
| Knowledge about the health care facility, n (%) | 289 (94%) |

* Mean age ± standard deviation.

CABA: Autonomous City of Buenos Aires.

TABLE 2. Diagnosis that led to consultation

| Diagnosis that led to consultation | N (%) |
|------------------------------------|------------|
| ALRTI | 89 (29%) |
| Infectious disease | 58 (19%) |
| Newborn infant care | 40 (13%) |
| Other | 28 (9%) |
| Jaundice | 21 (7%) |
| Gastrointestinal disease | 21 (7%) |
| Malformation | 12 (4%) |
| Ophthalmologic disease | 11 (3.50%) |
| Cardiac disease | 6 (2%) |
| Otorhinolaryngological disease | 8 (2.50%) |
| Head trauma | 5 (1.5%) |
| Surgical pathology | 5 (1.5%) |
| Dermatological disease | 3 (1%) |

ALRTI: acute lower respiratory tract infection.

Other: genetic disorders, etc.

TABLE 3. Distribution based on the adequacy of admission or consultation to Hospital Garrahan according to the level of care. N= 307 consultations

| Characteristics | Lack of adequacy (n= 260) | Adequacy (n= 47) |
|--|---------------------------|------------------|
| Malformation | 5 | 7 |
| ALRTI | 84 | 7 |
| Infectious disease | 57 | 5 |
| Jaundice | 22 | 0 |
| Newborn infant care | 41 | 0 |
| Gastrointestinal disease | 20 | 1 |
| Ophthalmologic disease | 11 | 0 |
| Otorhinolaryngological disease | 8 | 0 |
| Cardiac disease | 2 | 4 |
| Dermatological disease | 2 | 0 |
| Surgical pathology | 2 | 2 |
| Head trauma | 0 | 5 |
| Other | 8 | 16 |
| Health insurance coverage | 90 | 16 |
| Referred by other health care provider | 75 | 14 |

ARTI: acute respiratory tract infection.

and adequate equipment for continuous NBI monitoring.

The number of consultations did not peak during any season in particular but remained constant throughout the study period.

Once the external assessment team analyzed which patients could have been admitted to a primary or secondary care facility based on their morbidity and course, they established that 85% of consultations could have been solved at a public or private primary or secondary care facility. *Table 3* shows the details of this analysis.

DISCUSSION

This study met the objective of collecting the necessary data to make an in-depth analysis of the characteristics of NBIs \leq 30 days old who make a spontaneous demand for services at HG.

Based on the results of this study, it may be concluded that efforts made at decentralizing the health care system are still insufficient. Most admissions resulting from spontaneous demand could have been solved at a primary or secondary care facility. The NICU's human resources are qualified and trained to provide care to critical and complex patients but are being used to deal with medium or low complexity pathologies. In addition, these low complexity patients occupy a bed in the NICU and also take up hours of nurse care, and this results in the unavailability of resources to admit other NBIs with more complex conditions.

Consultations for newborn infant care or jaundice could have been solved at primary care facilities; the main purpose of PHCCs is to solve the basic health needs of a population group. Berra et al. underlined the importance of PHCCs that offer accessible health care services and are able to cover most population needs and develop a trusted relationship between patients and health care providers over time.⁵ In Argentina, the implementation of the PHCC approach has been characterized by its heterogeneity and lack of flow, with several coexisting community-, patient-, and family-centered models, pushing the traditional hospital health care model to the community setting with several levels of insertion, impact, and effectiveness.⁶

Based on our results, it is also worth noting that most mothers had been referred from the PHCC where their child was born, close to their home, for their one-year-old health checkup. This shows that the health care system works adequately in terms of "health." This

was also observed for patients born at a facility corresponding to their health insurance coverage. However, in the case of concurrent conditions, 54% of the times, the PHCC that was closer to their home was not able to respond to such demand.

Rabasa et al. showed that accessibility to a tertiary care unit in the case of NBIs with severe conditions decreased by half in the winter months. The authors pointed out that such reduction in accessibility is an example of the ineffective resource use because the increased bed occupation by patients with a respiratory infection who made a spontaneous demand for services reduces, even more, the potential accessibility for those who do require hospitalization in a tertiary care facility.⁷

In 2005, Rowensztein et al. assessed the reasons that led the population to seek care at HG. Results showed that the number of visits made to PHCCs, secondary and tertiary care hospitals prior to admission to HG was, in average, 2 per patient, and 62% attended tertiary care hospitals directly. In that study, 97.5% of patients had made a spontaneous demand for services at HG.⁸ Almost 10 years later, at the same hospital, our analysis of spontaneous demand showed some similarities: 46% of parents attended HG directly, and the rest attended HG after 2 previous visits to other facilities. A difference is that 1 in every 4 patients attended HG on the advice of a pediatrician or neonatologist who worked at other public or private institution. It is worth noting that, as mentioned in the Results section, none of the patients who had a recommendation for hospitalization had been referred in the appropriate manner for an infant younger than 30 days old who has a disease that requires hospitalization.

Kovacs et al. conducted a study with a similar design to this study in Brazil. The authors assessed the profile of children seen at the emergency departments of tertiary care hospitals who bypassed the PHCC corresponding to their home and the assigned family doctor. The main conclusion of that study was that parents decided to take their children to tertiary care hospitals because these were highly valued because of their prestige.⁹

Vinelli et al. analyzed the prevalence of non-urgent visits made at the emergency department of Hospital Elizalde, and pointed out that 59% of consultations were not urgent based on the Emergency Severity Index. They found that

the main reason for attending the emergency department was the difficulty for making an appointment at their PHCC.¹⁰

In terms of health insurance coverage, 35% of patients indicated that they had insurance. This was not expected because the number of patients with health insurance accepted through formal referrals to the NICU of HG is usually below 15%. It is observed that although patients in this group are born at an institution provided by their "private" insurance system, the system is later unable to deal with their concurrent conditions. Several parents first sought care at the facility where their child had been born but were not seen by a physician, either for administrative matters (payment request) or the lack of an on-call neonatologist. It is worth noting that most concurrent diseases in NBIs may be solved by a pediatrician.

This study has some weaknesses. Although strict measures were taken to detect any patient ≤ 30 days old who sought care at HG in the study period, we cannot rule out the possibility that some NBIs may have been seen by a specialist at the outpatient offices without the intervention of a neonatologist.

To sum up this discussion, the following may be pondered:

- In terms of neonatal diseases, the public health care system is prepared to see patients for health checkups but not to manage concurrent conditions.
- The private health care system is capable of providing coverage to patients at birth but not in the case of a concurrent disease.
- Pediatricians should reinforce the concept that referrals for the hospitalization of infants ≤ 30 days should be made from physician to physician.
- Care provided for concurrent diseases to patients ≤ 30 days old should be provided by primary or secondary public facilities or by private institutions; and if these are not able to solve them, they should make a formal referral for a consultation and/or hospitalization at HG.

CONCLUSION

The results of this study showed that infants younger than 30 days old who were seen at HG through spontaneous demand for services were, mostly, low or medium complexity patients whose conditions could have been solved at the facility where they were born. ■

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