

CURRENT PROCESS OF NEONATAL INTENSIVE CARE SERVICES IN ISTANBUL



Medical Science

KEYWORDS : Newborn, Intensive Care, Istanbul

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ABSTRACT

Aims: Quality of perinatal care is evaluated with establishing perinatal centers, socioeconomic status, education, competence of medical technology of population and especially maternal, perinatal and neonatal mortality and morbidity influenced by neonatal care organization.

The aim of the study was to determine current status of neonatal intensive care unit's incubator number, distribution and service and location of neonatologists in process in Istanbul.

Material and Method: In this retrospective study evaluations were performed by considering the current data that belongs to year 2014 of NICU's from the Public Inpatient Health Services and Emergency Health Services Branch Offices of Istanbul Provincial Health Directorate.

Results: The total number of neonatal beds in Istanbul is 1870 as of the year 2014 [1.level: 290(15.5%), 2nd level: 555 (29.7%), 3rd level: 1025 (54.8%)]. 511 (27.3%) of these beds are located in public health institutions. Neonatologists were available in hospitals which had 758 (40.5%) of neonatal beds in Istanbul. 308 (40.6%) of these beds located in special hospitals (20 neonatologists) and of 450 (59.4%) located in public hospitals (30 neonatologists). 18.2% of babies born in a year in Istanbul received inpatient treatment and it is noteworthy that nearly half of them (47.8%) followed in 3rd level beds.

Conclusions: It was detected that in Istanbul, the definition of level of neonatal beds was distorted, and that the number and working order of neonatologists were inadequate. Regionalization of perinatal care for Istanbul must be performed by taking sociodemographic data. In updating the official regulations for ensuring service delivery it is a necessity to keep realistic goals, and health policies regarding newborn health should be determined with participation of all the shareholders that have worked in newborn service delivery.

Introduction

Recent data shows that in Turkey in the last 10 years neonatal mortality rate decreased from 17 per thousand to 7, while in the last 5 years perinatal mortality rate decreased from 19 per thousand to 11 (1). The developments in the set-up of neonatal intensive care units (NICU) and experienced man power echoed into the mortality data, but we have yet to see official results regarding morbidity, complications and neurodevelopmental follow-up. One of the aims of perinatal care is not to only provide a life, but to provide a healthy life (2).

As a result of recognition of "neonatology" as a separate field worldwide in 1975, and improvement of newborn care, diagnosis, and treatment conditions, fascinating improvement in perinatal statistics, especially in the last decade is spectacular. Modern countries achieved these improvements through the regionalization of neonatal care (3). It is noted that internationally, as well as in Turkey, implementations executed within the scope of regionalization make up the basis of the approach in improving newborn mortality and morbidity rates (4,5). In the regionalization programme of perinatal care the organization of service

delivery plays a significant role (6,7).

In newborn health care delivery, presentation, and organization of Istanbul, where exists a complex socio-demographic structure, there is the need for serious multidisciplinary and transdisciplinary systematic approaches. The study was performed with the aim of determining the current situation of NICU services, and putting for the position of newborn experts within the process in the city of Istanbul.

Material and Method

In this retrospective study evaluations were performed by considering the current data that belongs to year 2014 of NICU's from the Public Inpatient Health Services and Emergency Health Services Branch Offices of Istanbul Provincial Health Directorate. The data from the hospitals were evaluated upon confirmation by the doctors and/or managers upon consultation. The data was handled accompanied by tables designated as subtitles regarding the study. In the analysis (ratio, arithmetic mean, and standard deviation) of data acquired from the study, MedCalc statistics application was used.

Results

Number of neonatal beds in Istanbul as of 31 December 2014 is 1870 [1st level: 290 (15.5%), 2nd level: 555 (29.7%), 3rd level: 1025 (54.8%)]. 511 of these beds (27.3% - 511/1870) belong to a total of 24 health institutions within Ministry of Health Turkish Association of Public Hospitals, and Public University Hospitals [1st level: 290 (15.5%), 2nd level: 218 (42.7%), 3rd level: 206 (40.3%)]. While in 142 health institutions affiliated to private hospitals and private university hospitals newborn number of beds is 1359 (72.7% - 1359/1870). [1st level: 203 (14.9%), 2nd level: 337 (24.8%), 3rd level: 819 (60.3%)]. In Istanbul, 70% of level 1 beds; 60.7% of level 2 beds; and 79.9% of level 3 beds are within private sector.

In every hospital to which 758 (40.5% - 758/1870) of newborn beds belong in Istanbul, there is one neonatologist. 308 (40.6%) of these beds belong to private hospitals, and 450 (59.4%) of these beds belong to public hospitals.

In 15 of 24 public hospitals to which 511 NICU beds belong, there are 30 newborn experts at work, and 14 of these hospitals also work as an education institution, and 6 of these institutions provide training for active neonatal minor training. In hospitals at which a newborn expert works, there are 450 newborn [1st level: 62 (13.8%), 2nd level: 186 (41.3%), 3rd level: 202 (44.9%)] beds. In approximately 88% of newborn beds within the body of Public Hospitals in Istanbul there is a neonatology expert at work, and their occupancy rates are >90%.

In 142 health institution within all the private hospitals (135) and private university hospitals (7), the total number of beds is 1359, and in 19 of these there are 20 neonatology expert at work. 7 of these hospitals also work as an education institution, and 1 of these institutions provide training for active newborn minor. In hospitals at which a newborn expert works, there are 308 newborn [1st level: 9 (2.9%), 2nd level: 24 (7.8%), 3rd level: 275 (89.3%)] beds. 254 (82.5%) of these beds are within hospitals that are in agreement with Social Security Institution. In approximately 23% of newborn beds within the body of Private Hospitals in Istanbul there is a neonatology expert at work, and their occupancy rates are <30%.

In Istanbul, of the newborn beds at which a neonatologist is in charge; 9.4% (71/758) were level 1, 27.7% (210/758) were level 2, and 62.9% (477/758) were level 3. In Istanbul, 40.5% (758/1870) of the newborn beds [level 1: 24.5% (71/290), level 2: 37.8% (210/555), level 3: 46.5% (477/1025)] was being supervised by a neonatologist.

Data of NICU bed levels in hospitals in Istanbul is in Table-1, newborn bed capacities are in Table-2. Within the public hospitals in the city of Istanbul, 19 beds in 3 units, and within the private hospitals 13 beds in 2 units served as surgical NICUs in pediatric surgery clinics. Data regarding the newborn inpatients in 2014 is presented in Table-3.

Conclusions

Results obtained from the study regarding newborn number of beds, distribution, and the place of neonatologists in the service in Istanbul shows that there is a need to consider various interpretations and perspectives in a number of ways. The concept of regionalized perinatal care, like in modern countries, seem to be the most significant step in preventing not only mortality but also morbidity of pregnant, mother, and newborn health in all parts of Turkey, and in Istanbul (8-10). The cosmopolitan nature of Istanbul indicate that perinatal centers should be deployed with socio-demographic structure in mind.

According to the address-based registry system as of the end of 2013, population of Turkey is around 76.7 million. In Istanbul

18.5% of Turkey's population resides in, where the highest population growth, and also the highest population is present. The population of Istanbul in the year 2013 was 14.160.467 with an increase of 1.54%, while it was 14.377.018 by the year 2014. Number of births in the year 2013 was 228.395, while it was 240.350 with an increase of 5.2% in the year 2014 (1,11-13). In our country, 1 of every 5 newborn beds is in Istanbul (14). The refugee crisis is expected to cause both an increase in general population, and increase even more the already in rise birth rate in Istanbul in 2015. In light of all these findings, it is apparent that Istanbul should be taken as an individual model and handled so, and also the perinatal care should be managed with the regionalization strategy within the city.

In order to standardize the number of NICU beds in our country, in the articles dated 2010 regarding the planning of intensive care units by Ministry of Health General Directorate of Health Services; for every 1000 live births one 3rd level and four 2nd level incubator (or a bed with radiant heater) was designated. 1st level planning was done so that for every 500 births 1 incubator would be provided. Also, in hospitals that had 2nd and 3rd level NICUs, 2-10 1st level beds according to the size of the unit was planned. Of the total amount of the total number of beds required in planning the intensive care units, 60% was to be met by the Ministry of Health hospitals, and 40% by the university and private hospitals. Regarding this planning, in 2014 in Istanbul where there were 240.350 births, it was seen appropriate that 240 in 3rd level, 960 in 2nd level, and despite not being noted exactly, at least 480 1st level newborn beds be designated. Whereas, in the Advice Regarding the Application Procedures and Principles of Intensive Care Services in Inpatient Health Institutions, it is mentioned that in places where the birth rate is under 1000, only 1st level NICUs be installed. When the literature is examined, according to the formulations where various factors are taken into account, it will be seen that newborn number of beds for 1000 live births fluctuates between 0.7-6.5 (15-19). In the statistical evaluation by Goodman et al., we can see that the minimum number of beds for 10,000 live births where newborn death was fewest, was 23.5. In light of the data obtained by this study, within Istanbul while the 1st and 2nd level beds were inadequate [1st level: 290 (15.5%), 2nd level: 555 (29.7%), 3rd level: 1025 (54.8%)], 3rd level number of beds were above the number of beds designated in this plan and evaluation. In Istanbul, it was found that even with repeating bedding, 18.2% of the alive newborns (43.731/240.350) took inpatient treatment, and around half (47.8%) of these newborns were being monitored in 3rd level beds. All these results points to the fact that the bed distribution in Istanbul is uneven.

We believe that the scientific adjustment of bed level definitions noted under the newborn care and treatment standards in Advice Regarding the Application Procedures and Principles of Intensive Care Services in Inpatient Health Institutions, the realistic designation of newborn number of bed levels in health institutions regarding the plans to be realized with the territorial socio-demographic structures in mind in Istanbul, development of a system to determine and check regularly the reimbursement according to the mortality and morbidity results of patients by Social Security Institution, and the establishment of all the plans in rational conditions with scientific councils with the participation of Neonatology Council of Turkey will contribute vastly in regulating the newborn bed distribution.

The calculations of neonatologists performed in vocational platforms in various countries was realized based on such diverse foundations as the number of neonatologists to number of births or number of children, the aim to reach the number that may be effective over neonatal mortality, and the designation of neonatologist per unit. In the United Kingdom (UK), for every 10,000 live births 5.83, in the United States (US) 10.37, in

Germany (DE) 21.16 neonatologist was designated (21-23). While in Istanbul as of 2014 this ratio is 2.1. According to these calculations, the number of neonatologists that should be present in Istanbul is respectively 140 (as regards to the UK), 249 (US), and 509 (DE). Goodman et al. noted that in 10,000 live births the increase from 2.7 to 4.3 in the number of neonatologists played a meaningful role in decreasing mortality (20). According to this formulation the number of neonatologists in Istanbul should be 103. While calculation of the number of neonatologist for each unit is a different methodology (24). However, the calculation of the above mentioned number is not realistic seeing as for the existence of neonatologists in hospitals within Istanbul, they are required to be level 3.B, and the non-existence of a standardization of bed levels defined with the regionalization model within hospitals. Even if we use all three methods, the number of neonatologists in Istanbul is inadequate. Also, while approximately 73% of newborn beds are in private health institutions, 60% of newborn beds monitored by newborn experts is supervised by neonatologists working in public sector. For this very reason, transferring the threatened and sick newborns from hospitals where there is newborn experts to where there is not tends to happen. Despite the inadequate number of expert neonatologists and uneven distribution of neonatologists in Istanbul, and Advice Regarding the Application Procedures and Principles of Intensive Care Services in Inpatient Health Institutions it is underlined that adequate number of experts be met, the limitation of number of students in the newborn specialty minor is a serious contradiction.

While the public institutions in Istanbul serve mostly in 1st and 2nd level newborn beds, private health institutions serve mostly in 3rd level beds. While this situation can be interpreted in such a way that the patients in need of 3rd level intensive care which cannot be dealt with by public sectors is filled in by private sector, the fact that Social Security Institution reimburses the 3rd level newborn service way higher, and also that 1 out of 5 infants born in Istanbul is an inpatient in newborn clinics causes a serious complication in approaching this subject.

The limiting factor of the study is that, the current conditions of mostly nurses and other allied health personnel that play a critical role in newborn care was not examined (25). Because of the fact that in Turkey's reality the concept of an expert nurse (newborn expert nurse) does not exist, the workload of personnel in this service sector, the unsatisfying wage-gap, and other socio-

logical reasons, depending on the variability, it was not possible to periodically designate a nurse and other allied health personnel up to one year.

Regarding the modernization of societies, the most important statistical data are those of newborns, for that very reason continuing to statistically approach to the developed countries in a rational fashion as we did in recent years regarding newborn deaths, and the creation of a system that enables us to not just live, but live healthy lives will be possible with the newborn experts whose numbers will rise through quality education (9,20). When all data is evaluated, it was found that in Istanbul, the definition and distribution of newborn bed levels was distorted, and the newborn experts were numerically inadequate, and their working order was disorderly. In ensuring service delivery, it is of the essence that official advices, notices, and regulations definitely be updated with realistic goals in mind, and that the health policies regarding newborn health be determined with the participation of all partners working in newborn service delivery. Like in all the other developed countries, in a big cosmopolitan city such as Istanbul, the prerequisites that draw the most attention is that the regionalized perinatal care be supported both with regional approaches, and be embraced in basic health policies by central administration.

Table 1: Newborn intensive care bed levels in Istanbul, 2014

Bed Level	Number of beds in TAPH* Hospitals and Public Universities		Number of beds in Private Universities and Private Hospitals		Total
	Neonatologist exists Number of beds (%)	Neonatologist does not exist Number of beds (%)	Neonatologist exists Number of beds (%)	Neonatologist does not exist Number of beds (%)	Number of beds (%)
Level 1	62 (13.8)	25 (41)	9 (2.9)	194 (18.4)	290 (15.5)
Level 2	186 (41.3)	32 (52.5)	24 (7.8)	313 (29.8)	555 (29.7)
Level 3	202 (44.9)	4 (6.6)	275 (89.3)	544 (51.8)	1025 (54.8)
Total	450 (100)	61 (100)	308 (100)	1051 (100)	1870 (100)

*TAPH: Turkish Association of Public Hospitals

Table 2: Neonatal bed capacities in Istanbul, 2014

Number of Beds	TAPH* Hospitals and Public Universities				Private Hospitals and Private Universities				Total	
	Neonatologist exists		Neonatologist does not exist		Neonatologist exists		Neonatologist does not exist		Number of Hospitals (%)	Number of beds (%)
	Number of Hospitals (%)	Number of beds (%)	Number of Hospitals (%)	Number of beds (%)	Number of Hospitals (%)	Number of beds (%)	Number of Hospitals (%)	Number of beds (%)		
0-5			5 (55.6)	20 (32.8)	2 (10.5)	9 (2.9)	60 (48.8)	194 (18.5)	67 (40.4)	223 (11.9)
6-10	2 (13.3)	17 (3.8)	2 (22.2)	15 (24.6)	6 (31.6)	44 (14.3)	29 (23.6)	230 (21.9)	39 (23.5)	306 (16.4)
11-20	4 (26.7)	70 (15.6)	2 (22.2)	26 (42.6)	7 (36.8)	111 (36)	24 (19.5)	349 (33.2)	37 (22.3)	556 (29.7)
21-30	4 (26.7)	97 (21.6)			1 (5.3)	22 (7.2)	9 (7.3)	232 (22.1)	14 (8.4)	351 (18.8)
>30	5 (33.3)	266 (59.1)			3 (15.8)	122 (39.6)	1 (0.8)	46 (4.3)	9 (5.4)	434 (23.2)
Total	15 (100)	450 (100)	9 (100)	61 (100)	19 (100)	308 (100)	123 (100)	1051 (100)	166 (100)	1870 (100)

* TAPH: Turkish Association of Public Hospitals

Table 3: Newborn patients receiving inpatient treatment in Istanbul, 2014

Bed Levels	TAPH* Hospitals and Public Univer- sities	Private Hos- pitals and Pri- vate University Hospitals	TOTAL
	Number of Inpatients (%)	Number of Inpatients (%)	Number of Inpatients (%)
Level 1	4844 (33.7)	7132 (24.3)	11976 (27.4)
Level 2	5521 (38.4)	5330 (18.2)	10851 (24.8)
Level 3	3997 (27.9)	16907 (57.6)	20904 (47.8)
TOTAL	14362 (100)	29369 (100)	43731 (100)

*TAPH: Turkish Association of Public Hospitals

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