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Birth Tourism and Neonatal Intensive Care: A Children's Hospital Experience

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Abstract

Objective—The aim of this article is to examine characteristics of birth tourism (BT) neonates admitted to a neonatal intensive care unit (NICU).

Methods—This was a retrospective review over 3 years; BT cases were identified, and relevant perinatal, medical, social, and financial data were collected and compared with 100 randomly selected non–birth tourism neonates.

Results—A total of 46 BT neonates were identified. They were more likely to be born to older women (34 vs. 29 years; $p < 0.001$), via cesarean delivery (72 vs. 48%; $p = 0.007$), and at a referral facility (80 vs. 32%; $p < 0.001$). BT group had longer hospital stay (15 vs. 7 days; $p = 0.02$), more surgical intervention (50 vs. 21%; $p < 0.001$), and higher hospital charges (median $287,501 vs. $103,105; $p = 0.003$). One-third of BT neonates were enrolled in public health insurance program and four BT neonates (10%) were placed for adoption.

Conclusion—Families of BT neonates admitted to the NICU face significant challenges. Larger studies are needed to better define impacts on families, health care system, and society.

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Conflict of Interest

None.

Contributors' Statement

Dr. Mikhael contributed to the conceptualization and design of the study, the IRB application, the collection, analysis, and interpretation of the data. He drafted the initial manuscript and approved the final manuscript as submitted.

Dr. Cleary contributed to the conceptualization and design of the study, and the analysis and interpretation of the data. He reviewed all drafts of the manuscript and approved the final manuscript as submitted.

Drs. Dhar and Chang contributed to the interpretation of the data. They reviewed all drafts of the manuscript and approved the final manuscript as submitted.

Yanjun Chen contributed to the analysis and interpretation of the data. She contributed to all drafts of the manuscript and approved the final manuscript as submitted.

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Keywords

birth tourism; neonate; neonatal intensive care; children's hospital

The Citizenship Clause of the Fourteenth Amendment to the United States Constitution states that "All persons born or naturalized in the United States, and subject to the jurisdiction thereof, are citizens of the United States and of the State wherein they reside." Recent news reports have highlighted the issue of "birth tourism" (BT) in the United States, that is, when pregnant women travel for the purpose of delivering in the United States to obtain benefits and rights of citizenship for their neonates. The families preplan their visit and make financial arrangements with the expectation of a short hospital stay for mother and neonate. They almost always return to their home countries shortly after giving birth and obtaining proof of citizenship for their new child.[1–3]

Approximately 10% of all neonates are admitted to a neonatal intensive care unit (NICU) due to prematurity, congenital anomalies, or other illness.[4] NICU hospitalization is emotionally and financially stressful for families and can lead to social hardships.[5,6]

The United States currently does not provide universal health coverage to its citizens. Neonates are insured either by their family's privately purchased policy or by government-sponsored programs based on specific eligibility criteria. Otherwise, they are considered uninsured (self-pay). To date, there have been no reports in the literature regarding BT and NICU hospitalization in the United States. Therefore, we performed a retrospective review at our institution to examine medical, social, and financial characteristics of BT neonates admitted to a NICU.

Methods

Study Design and Setting

This is a retrospective descriptive study of all admissions from February 2012 to January 2015 to the NICU at the Children's Hospital of Orange County (CHOC), Orange, CA, a quaternary-level NICU that serves as a referral center for the large geographical area of Orange, Los Angeles, Riverside, and San Bernardino counties. CHOC is a nonprofit teaching hospital and has one of two regional NICUs in Orange County, according to California Children's Services. There is no maternity service at CHOC; neonates delivered in the adjacent physically joined hospital and cared for immediately after birth are referred to as "inborn" in our study.

Case managers and social workers meet with the families of all hospitalized neonates routinely to offer supportive services and educate families on available resources. Neonates born to families who visited the United States with a plan to deliver and return to their home countries after birth were identified through medical and social records review. Relevant perinatal, medical, and social data were collected and compared with a randomly selected "control" group of 100 neonates admitted during same time period. Our main aim of the study is to describe the characteristics of the hospitalized BT neonates in comparison to the non–birth tourism (NBT) neonates. For this specific aim, a randomly selected control cohort,

rather than matching for different variables, such as gestational age, birth weight, and gender, was chosen to provide unbiased estimates and comparison of the study cohorts. Matching for maternal age was performed post hoc to compare variables that are potentially confounded by maternal age. The study was approved by the institutional review board (IRB) of the CHOC.

Study Variables

Perinatal variables included maternal age, gestational age, birth weight, mode of delivery, 5-minute Apgar score, and need for resuscitation at birth. Medical variables reported included neonates age upon admissions, sources of referral, primary reason for admission, length of hospitalization, medical dispositions (alive, dead, or transferred), and if patients visited the emergency room or were hospitalized within 30 days of discharge. We described our neonates similar to how the Children's Hospital's Neonatal Database (CHND), a collaboration of leaders from 27 regional NICUs, described the population of neonates cared for in these centers.[7] The primary reasons for referral were prematurity, surgical, respiratory, neurological, or cardiac management. Miscellaneous reasons such as hypoglycemia, sepsis evaluation, and hyperbilirubinemia were listed under others. We also determined if the neonates were discharged to biological or adoptive families according to social services records. Financial data included type of health insurance and total hospital charges.

Data Analysis

Statistical comparisons between the BT group and control NBT groups used the nonparametric Wilcoxon–Mann–Whitney test for continuous variables due to the limited sample size and to avoid normality assumption. Differences in categorical variables in these two groups were determined using chi-square test. (Results were the same using Fisher exact test, so chi-square test results were reported throughout.) Formal statistical comparisons of categorical variables (i.e., p-values) were not conducted where the number of events was inadequate for analysis (indicated by dashes in results' tables). We also conducted a secondary analysis with maternal age matching using propensity score matching. All analysis was performed using SAS 9.4 (SAS, Cary, NC) with significance level set to 0.05. Because the study is exploratory, no adjustment was made for multiple comparisons.

Results

During the study period, there were 2,153 admissions to the NICU. In total, 46 neonates were identified as the BT groups, accounting for 50 admissions or episodes of care (EOC), as 2 neonates were readmitted to the NICU once and 1 was readmitted twice.

When the study timeline is split into three equal epochs of 12 months each, there was a steady increase of EOC with 7 EOC in the first epoch, 12 in the second, and 31 in the most recent epoch.

Perinatal and Demographic Characteristics

Upon comparison of the 46 BT neonates and 100 randomly selected NBT neonates, the BT neonates were more likely to be born to older women (34 vs. 29 years; $p < 0.001$) and via

caesarean delivery (72 vs. 48%; $p = 0.007$). Among neonates delivered via caesarean delivery, 70% of BT neonates were delivered for elective reasons versus 35% in the NBT group ($p = 0.002$). The NBT neonates were predominantly white (51%) or Hispanic (40%), while the majority of BT group was Asian (89%), precisely from China and Taiwan. There were no significant differences in gestational age, birth weight, sex, Apgar score, or delivery room management (Table 1).

Patient Characteristics and Reasons for Referral

BT infant were more likely to be outborn (80 vs. 32%; $p < 0.001$). The top two primary reasons for referral among BT group were surgical evaluation (43%) and respiratory evaluation (26%), compared with 10% for surgical and 13% for respiratory evaluation in the NBT group. The most common reasons for NBT hospitalization were prematurity (25%) or other miscellaneous reasons (34%). BT neonates had longer hospital stay (15 vs. 7 days; $p = 0.02$), and half of them required one or more surgical interventions in comparison to only one-fifth of the NBT group ($p < 0.001$) (Table 2).

Medical and Social Outcomes

Four BT neonates died in the hospital (8.6%), in comparison to only one (1%) of NBT neonates. The primary diagnoses for the four BT neonates who died were laryngeal atresia, congenital hyperammonemia, prematurity with multiple congenital anomalies, and prematurity with congenital heart disease. The NBT neonate who died had a severe neurological insult of unclear etiology and respiratory failure.

A total of 40 BT and 95 NBT neonates were discharged to their caregivers, as 2 BT and 4 NBT neonates were transferred to referral hospitals or chronic care facilities. Within 30 days of hospital discharge, more BT neonates visited the emergency room (15 vs. 8.4%; $p = 0.25$) and more were rehospitalized (15 vs. 5.2%; $p = 0.058$) one or more times, although both were not statistically significant (Table 3).

Four BT neonates (10%) were discharged to nonbiological caregivers, in comparison to 1% of NBT group. The four BT neonates placed for adoption by their biological families had primary diagnoses of chromosomal anomaly, severe encephalopathy of unclear etiology, prematurity complicated with surgical necrotizing enterocolitis, and Down syndrome with imperforate anus requiring colostomy. One NBT neonate was discharged to foster care, due to a maternal substance abuse history.

Financial Analysis

Although all BT neonates were uninsured upon delivery, one-third (16) were subsequently enrolled in public health insurance program and two neonates were enrolled in commercial insurance; the remaining patients (28) remained uninsured. All of NBT neonates were insured with 59% enrolled in public and 41% in commercial insurance programs.

Total hospital charges (median US dollars [interquartile range]) were significantly higher in the BT group ($287,501 [$81,655–$626,487]) vs. $103,105 [$42,438–$286,093]; $p = 0.003$).

The charges per hospital day also remained significantly higher for the BT group (median $15,937 [$11,908–$22,287] vs. $12,323 [$10,580–$15,706]; $p \leq 0.001$).

Matched Pair Analyses

Additional analysis matching for maternal age was performed post hoc comparing variable potentiallyconfounded by maternal age, namely, cesarean delivery, requirement for surgical procedures, length of stay (LOS), and in-hospital mortality based on 39 matched pairs. The results are summarized in Table 4, which are quite similar to the main analyses. For LOS, we note that the difference between groups is now not statistically significant based on the matched cohorts, although the actual median LOS (14 days for BT vs. 7 days for NBT) remained essentially identical to the randomly selected cohorts (15 days for BT vs. 7 days for NBT). Thus, the substantial reduction in sample size affected the *p*-value as expected, but the actual point estimates show that the substantive difference in LOS was unchanged.

Discussion

This is the first report attempting to define the impact of BT in the United States and NICU hospitalization. Although the topic of BT has received media attention, especially in southern California,[1–3] to date there have been no academic studies of the issue.

EOC almost doubled from first epoch (7) to second epoch (12) and increased by 2.5 times from second to most recent epoch (31). This may suggest an increase in BT in our region or possibly increase in BT referrals to our institution.

Although there were no statistically significant differences between groups in birth weight, gestational age, Apgar scores, or delivery room level of care, the BT group had mortality rate of 8.6%, in comparison to 1% for NBT group. (Formal statistical comparison of mortality between groups was not conducted due to inadequate data.) That could be explained in part by the reasons and sources of referral, as more of the NBT group neonates were inborn and admitted with relatively less critical medical conditions. When we compared the BT group mortality rate (8.6%) to CHND mortality rate (5.6%)[7] or our institution recent (2012–2014) mortality rate (3.6%), it was not statistically significant ($p = 0.36$ and 0.06, respectively).

The BT group had more complex hospitalization, as more neonates required surgical intervention, had longer hospital stay, tendency ($p = 0.058$) toward rehospitalization within 30 days after discharge, and higher hospital charges, which all can be explained in part by difference in primary reasons for referral.

There were no differences between BT and randomly selected groups in factors such as birth weight, gestational age, and gender. Further matching for inborn versus referral was not performed, given the relatively small BT group and descriptive nature of the report.

There is no evidence from the record that any of BT families preplanned placing their neonates for adoption before traveling to the United States. It is worthy of note that the four BT neonates who were placed by their biological families for adoption had ongoing medical

needs and anticipated adverse neurodevelopmental outcomes. These neonates will require health services which might not be readily available in their biological families' home countries.

All BT neonates were uninsured (self-pay) upon admission to the NICU. Families had preplanned their visit and made logistic and financial arrangements, with the expectation of a short hospital stay for mother and neonate. As the BT neonates were admitted to the NICU, one-third were enrolled in a public health insurance program, which usually entails demonstrating local residency and annual income not to exceed 138% of federal poverty level or refugee status.[8]

Our study has several limitations including being a retrospective study of a descriptive nature, done at a single institution, and with relatively small sample size of the BT group. Also, we may have not identified all cases, if families did not self-identify.

This work attempts to begin a scientific evaluation of the impact of BTon families and the health care system. We report the measurable differences between groups and hope that future work may quantify and address the distress and anxiety apparent in such families. It will be of great importance if a population-based epidemiological study can be conducted of all BT in a certain geographical location, that is, state, county, or large metropolitan area, and examine NICU admission rate. It is possible that NICU admission rate among BT neonates is higher than the general population as advanced maternal age, extensive travel, and exhaustion of pregnant women can cause preterm deliveries or neonatal distress. Also, it is possible that some families find that their unborn child has a congenital defect, and travel to the United States prior to delivery seeking medical treatment.

In summary, families of BT neonates admitted to the NICU face unanticipated medical, social, and financial challenges. Larger studies are needed to better define the impact on BT families, health care system, and society.

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Table 1

Patient perinatal and demographic characteristics

	Birth tourism (*n* = 46)	**Non–birth tourism (*n* = 100)**	***p***
Maternal age, mean ± SD (y)	33.8 ± 4.5	29.6 ± 7.1	<0.001
Gestational age, mean ± SD (wk)	36.7 ± 3.6	35.6 ± 4.2	0.17
Birth weight, mean ± SD (g)	2,719 ± 819	2,685 ± 914	0.9
Male sex, *n* (%)	29 (63)	56 (56)	0.42
Cesarean delivery, *n* (%)	33 (71.7)	48 (48)	0.007
Elective cesarean delivery, *n* (%)	23 (69.7)	17 (35.4)	0.002
Median 5-minute Apgar score (IQR)	9 (8–9)	9 (8–9)	0.7
Routine delivery room management[a] *n* (%)	29 (63)	70 (70)	0.65
Race, *n* (%)			
Non-Hispanic white	5 (10.9)	51 (51)	–
Hispanic	0	40 (40)	–
Black	0	0	–
Asian	41 (89.1)	6 (6)	–
Other	0	3 (3)	–

[a]Routine delivery room management is defined as not needing any resuscitation in the delivery room beyond providing warmth, stimulation, and clearing the airway.

Table 2

Patient characteristics at the time of referral/admission

	Birth tourism (*n* = 46)	**Non–birth tourism (*n* = 100)**	***p***
Median chronological age at admission, d (IQR)	1 (0–4)	1 (0–4)	0.2
Referral sources (%)			
Inborn	15.2	55	<.001[a]
Emergency room	4.3	13	
Referral NICU	80.5	32	
Primary reason for referral (%)			
Surgical evaluation/management	43.5	10	<0.001[b]
Respiratory evaluation/management	26.1	13	
Neurologic evaluation/management	0	5	
Cardiac evaluation/management	13	13	
Preterm without other comorbidities	4.4	25	
Other	13	34	
Required surgical procedure or intervention (%)	50	21	<0.001
Median length of stay, d (IQR)	15 (5–38)	7 (3–17)	0.02

[a] Inborn versus referral.

[b] Surgical evaluation versus respiratory evaluation versus all other categories.

Table 3

Medical and social outcomes

	Birth tourism	Non–birth tourism	*p*
In-hospital mortality, *n* (%)	4/46 (8.6)	1/100 (1)	–
Emergency room visits within 30 days of discharge[a] *n* (%)	6/40 (15)	8/95 (8.4)	0.25
Rehospitalization within 30 days of discharge,[a] *n* (%)	6/40 (15)	5/95 (5.2)	0.058
Social disposition[a] *n* (%)			
Adoptive or foster care family	4 (10)	1 (1)	–
Biological family	36 (90)	94 (99)	–

[a]For patients who were discharged to their families. Two birth tourism and four non–birth tourism neonates were transferred to other facilities.

Table 4

Comparison based on maternal age-matched cohorts

	Birth tourism (*n* = 39)	**Non–birth tourism (*n* = 39)**	***p***
Cesarean delivery, *n* (%)	27 (69.2)	18 (46.1)	0.039
Required surgical procedure or intervention, *n* (%)	20 (51.2)	7 (17.9)	0.002
Median length of stay, d (IQR)	14 (5–38)	7 (4–31)	0.4
In-hospital mortality, *n* (%)	3 (7.7)	1 (2.5)	0.45