

# A Descriptive Study of Transient Neonatal Feeding Intolerance in a Tertiary Care Center in Turkey

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## ABSTRACT

**Objective:** To investigate the characteristic features of transient neonatal feeding intolerance (TNFI) during the hospitalization for birth in the maternity ward.

**Design:** A prospective follow-up study.

**Setting:** Maternity ward and neonatal intensive care unit (NICU) in an academic medical center.

**Participants:** Term ( $\geq 37$ -weeks gestation) infants admitted to the neonatal intensive care unit with recurrent vomiting and refusal to feed between January and December 2011. These infants were prospectively followed-up at 1, 2, 4, 6 months of age in the outpatient clinic.

**Results:** During the study period 1280 infants were evaluated in the maternity ward. Forty-eight (3.75%) neonates with repeated vomiting and refusal to feed were hospitalized from the maternity unit to the NICU Level I on the first postnatal day for further investigation. All infants started vomiting in the first day (median 5.75 hours; interquartile range: 1–24) and recovered by the 48<sup>th</sup> postnatal hour (median 27.5 hours; interquartile range: 14–48 hours). Laboratory and imaging studies showed no abnormalities. After discharge, 6-month follow-up of these infants showed no vomiting or feeding intolerance during well-child visits.

**Conclusions:** Infants with TNFI can be managed with close observation and supportive measures if they have no other indications of underlying disease. We believe that expectant management and supportive measures under skilled nursing care will prevent unnecessary diagnostic evaluation, mother/infant separation, and prolonged hospital stay.

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The ability to feed by mouth is of paramount importance in the newborn infant, and successful achievement of breastfeeding during the birth hospitalization in the maternity ward is a critical task for the infant/mother dyad. A full-term infant should be offered the breast as soon after the birth as possible, preferably within the first hour after delivery (Gartner et al., 2005). Establishing adequate feeding is a vital component of newborn care (Flaherman & Newman, 2011; Gartner et al.). The development of feeding skills is a complex process, and attainment of oral feeding skills during the hospital stay is a criteria for allowing discharge home (Stevenson & Allaire, 1991). However, feeding intolerance in the early postnatal period is a common condition and when refusal to feed accompanies repeated vomiting, it can be distressing for health care providers and families (Di Lorenzo, 2012).

Feeding intolerance in the newborn might be a symptom of a multitude of conditions that can range from mild, self-limited diseases to severe, life-threatening disorders (Di Lorenzo, 2012; Piazza & Stoll, 2007). It is usually a benign condition; however, some infants exhibit refusal to feed with voluminous and frequent vomiting as a forceful expulsion of the feedings in the first few days after birth, despite being in a good clinical condition. These infants may undergo unnecessary diagnostic evaluations, until vomiting abates within several days under close observation without any treatment.

To the best of our knowledge, there is no definition or classification in the literature to describe this condition, giving rise to a diagnostic dilemma. We designed a study to define the characteristic features of infants with transient neonatal

feeding intolerance (TNFI) to prevent this population from unnecessary mother/infant separation for diagnostic purposes.

## Methods

### Study Population

The study was conducted with 48 neonates who were admitted to the Fatih University Medical School's Neonatal Intensive Care Unit (NICU) Level I from the maternity unit of the same hospital, which is a tertiary care academic center. Enrollment to the study took place between January and December 2011. The study was initiated upon approval by the Local Ethics Committee of Fatih University Medical School.

Standard rooming-in was encouraged for all mothers immediately after vaginal delivery and within the first hour after cesarean as per hospital protocol. Inclusion criteria were term gestational age (>37weeks) with no obstetric complications, less than 1 week of age, at least one large-volume vomiting with every feeding attempt, and lactation consultant/nurse practitioner's expression of infant's refusal to feed. Preterm infants and term infants with a dysmorphic facial appearance, anatomic malformation of the gastrointestinal system, cleft lip and/or palate, respiratory symptoms, or with a mother with intrapartum fever, prolonged rupture of membranes, and/or chorioamnionitis were excluded. Infants with vomiting who had a good clinical conditions and were able to be fed orally were defined as gastroesophageal reflux (GER) and also excluded from the study. Evaluation of the infant's clinical condition was left to the nurse practitioner's or physician's discretion.

The nurse practitioners and lactation consultants who were engaged in the study evaluated the mothers for their understanding of the signs of hunger, including rooting, sucking, fussing, putting hand to mouth, and signs of fullness including closing the mouth, turning the head away, relaxing arms and hands. They also questioned the frequency of feedings (if the mothers were breastfeeding 8–12 times a day) and if the infant was having at least three wet diapers and three stools per day. All infants who had at least one large volume vomiting with every feeding attempt and were unable to be fed orally despite a good latch, which was noted in the maternity unit either by a caregiver, nurse practitioner, or lactation consultant were investigated. *Refusal to feed* was defined as a neonate's refusing to latch on or lack of sucking/swallowing while the mother was

## Neonatal feeding intolerance in the maternity ward can be distressing for health care providers and families.

spending adequate effort observed by the lactation consultant. A detailed prenatal maternal and fetal history was obtained before admission to the NICU.

It is our policy to evaluate each infant's serum levels of white blood cell count (WBC), C-reactive protein (CRP), and interleukin-6 (IL-6) upon admission to the NICU along with abdominal radiographs to rule out a possible infection or gastrointestinal obstruction. Any infant with a definitive final diagnosis that may cause vomiting such as early-onset neonatal sepsis, an inborn error of metabolism, urinary tract infection, or intestinal obstruction was excluded from the study.

After discharge from the hospital, all infants were prospectively followed at 1, 2, 4, and 6 months of age in the outpatient clinic. Data regarding vomiting or feeding intolerance were recorded in the patient charts.

### Laboratory Assessment

Venous blood samples were collected and centrifuged at 3000g for 15 min at 4°C. IL-6 levels were measured by the Enzyme Amplified Sensitivity Immunoassay (EASIA) method. C-reactive protein levels and complete blood counts were measured in serum specimens.

### Statistical Analysis

Data were statistically analyzed using SPSS (version 16.0.1). Continuous data regarding the time of the first and last vomit, CRP, and IL-6 were tested for normality using the Kolmogorov-Smirnov test. All the continuous values with nongaussian distribution were presented as median (interquartile range). The categorical values were presented as number and percentage.

## Results

During the study period, 1280 infants were born in our hospital. Forty-eight (3.75%) neonates with repeated vomiting and refusal to feed were hospitalized from the maternity unit to the NICU Level I on the first postnatal day for further investigation. Twenty infants (42%) with a final diagnosis of early-onset neonatal sepsis, two (4%) with intestinal obstruction, one (2%) with organic acidemia, and one (2%) with urinary tract infection

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