Case

Christine, a 4-month-old infant, is brought to the office for a health-supervision visit by her mother, a 30-year-old emergency department nurse. The mother, who is well known to the pediatrician to be a competent and attentive caregiver, appears uncharacteristically tired. They are accompanied by the 18-month-old and 4-year-old siblings because child care was unavailable, and her husband has been out of town on business for the last 5 weeks. When the pediatrician comments, “You look exhausted. It must be really tough to care for 3 young children,” the mother appears relieved that attention was given to her needs. She reports that she has not been getting much sleep because Christine wakes up for 2 or more evening feedings and the toddler is now awakening at night. During the day, she juggles nursing the baby, caring for her other 2 young children, and managing the household. Although visibly fatigued and mildly depressed, the mother appears comfortable holding Christine; the baby likewise appeared closely attached. The mother has no concerns regarding Christine’s health or development.

During the physical examination, Christine is a slightly thin but active and alert infant. She has no remarkable or focal physical findings; her muscle strength, tone, and reflexes are normal. She achieves all motor, social, and language milestones for a 4-month-old infant. Plotting her height and weight on the growth chart, the pediatrician and mother were surprised to see that her weight did not change in 2 months, and her linear growth decelerated slightly. The growth measurements were repeated and corroborated. In the office, Christine was a vigorous feeder, latching onto the full areola quickly. The mother reports that breastfeeding occurs every 4 to 5 hours for at least 10 minutes on each breast. Her urine output and bowel movements are normal, and she did not have a history of vomiting or excessive regurgitation. The mother’s diet and fluid intake seem adequate.

A review of past medical history does not reveal an explanation for Christine’s failure to gain weight. She was born full-term after an uncomplicated pregnancy and a normal spontaneous vaginal delivery. Her birth weight was 8 pounds. She was nursing vigorously by the time of discharge from the hospital. At her 2-week and 2-month health-supervision visits, her weight and linear growth and developmental milestones were normal. In addition, at those visits she was observed to respond quickly to visual and auditory cues. There was no family history of serious diseases.

In that a comprehensive history and physical examination did not indicate an organic cause, the pediatrician reasoned that the most likely cause of her failure to thrive was an unintentional caloric deprivation secondary to maternal stress and exhaustion. Christine’s mother and the pediatrician discussed how maternal stress, fatigue, and depression could hinder the let-down reflex and reduce the availability of an adequate milk supply, as well as make it difficult to maintain regular feeding sessions. The pediatrician recommended obtaining help with child care and household responsibilities. The mother was also encouraged to consume adequate fluids, eat high-protein foods, nurse more frequently, and offer a formula supplement after nursing 3 times a day.

At the same time that these therapeutic interventions were initiated, screening laboratory studies were obtained. All results were normal, including a complete blood cell count with differential; serum electrolytes, creatinine, hepatic transaminase (ALT), total protein, and albumin; urinalysis; and stool fat, free glycosuria, bilirubin, and occult blood. A serum thyroxine was normal (6.3 mg/dL). A plan was made for Christine to return to the office in 1 week.

Dr Martin T. Stein

The biopsychosocial model is an effective guide for pediatricians who care for infants, children, and adolescents. It is particularly useful during early infancy when faced with a feeding problem. The interaction between physiological functions and psychological factors shapes our clinical thinking when confronted, in particular, with a nutritional disorder.

During the early infant period, growth is dependent on a healthy relationship between a baby and its mother (or caretaker). The quality of attachment between an infant and mother is delineated during an observation of a feeding episode. Pediatricians use these moments in the office to assess mother-child attachment and the characteristics of the feeding process. Christine appeared to be nursing adequately; she demonstrated behaviors that reflect a positive attachment to her mother and appropriate mechanics of nursing. Without historical clues to explain failure to thrive between 2 and 4 months of age, the normal physical examination and the normal breastfeeding observation left the pediatrician uncertain about the cause for growth deficiency. By systematically incorporating biological and psychosocial factors, the out-
come in these cases is usually successful with an early intervention.

Two pediatricians were invited to comment on this challenging case. Dr Daniel Kessler is a developmental-behavioral pediatrician who is a Clinical Associate Professor of Pediatrics and Director of Developmental and Behavioral Pediatrics at the Arizona Child Study Center, Children’s Health Center of St Joseph’s Hospital and Medical Center in Phoenix, Arizona. Dr Kessler is coeditor of a recent book of significant value to pediatricians, *Failure to Thrive and Pediatric Undernutrition: A Transdisciplinary Approach.*

**Dr Eustratia (“Tia”) Hubbard** is a fellow in Developmental and Behavioral Pediatrics at the University of California, San Diego.

**Dr Daniel B. Kessler**

The case of Christine, a 4-month-old infant with failure to thrive (or what my colleague Peter Dawson and I prefer to call “pediatric undernutrition”) presents the primary care provider with a diagnostic challenge. This child presents with a significant deceleration in her expected pattern of growth. At the 2-month office visit, the history indicates that her weight increased from 8 pounds at birth to the 75th percentile of the National Center for Health Statistics (NCHS) growth curves (assuming she had maintained this growth percentile). Four-month-old girls are expected to gain an average of 26 g per day. Christine did not gain any weight during this time period, and her linear growth showed a deceleration as well. Christine is described as otherwise doing well and making expected gains in the developmental domains assessed. History and physical examination as well as basic screening laboratory evaluations are normal. To determine the cause or causes of this growth problem, the primary care provider needs to carefully review the presenting data to determine possible risk factors for poor or no growth.

Failure to gain weight or pediatric undernutrition in the exclusively breastfed infant is somewhat of a mystery. In a mature, experienced mother, lactation difficulties would be unexpected. Passive, undemanding infants may fuss less and consume less than the required amount of calories needed for growth in this rapid growth phase of infancy. Feeding at 4- to 5-hour intervals may be a little long for Christine to go between nursing. Undernutrition in this time frame in a breastfed infant has also been associated with a significant amount of underlying illness in the infant or in the mother. So far there is no evidence for either.

Had Christine’s weight gain been slow rather than absent, it may have been helpful to review her weight using a growth chart for exclusively breastfed infants. Several studies have found that breastfed infants follow a different growth trajectory than what the 1977 NCHS growth charts indicate. Exclusively breastfed infants can show significant decreases in weight for age and smaller decreases in length for age and weight for length than bottle-fed infants when using the NCHS charts. This is because the data sets used to construct these curves had few breastfed infants. This slower increase in weight can be particularly prominent between 3 and 12 months and is of no concern in the otherwise healthy infant. The revised growth charts have a higher proportion of breastfed infants than the 1977 charts, and this should no longer be a cause for concern.

In contrast with the absence of contributing historical or physical examination data that might provide a diagnostic clue for an organic cause for Christine’s lack of expected growth, the psychosocial data are rich in risk factors. She is the third of 3 children born in a 4-year time span, just 14 months younger than her next-oldest sibling. Christine is still waking for a feeding at least twice a night (a good sign), and now the 18 month old is waking in the night as well. Her mother has been single-parenting for the past 5 weeks as her husband is away on a business trip. She must juggle the needs of her young family and her own needs, which often appear last in the equation. We are not told of extended family or other environmental supports. The mother sounds and looks depressed. Parental depression, particularly in the primary caregiver, is a risk factor for inadequate growth in an infant.

In this type of situation, the primary care pediatrician has an advantage over his or her specialist colleagues. This is the advantage of relationships developed over time and a longitudinal perspective. The pediatrician was obviously quite comfortable in this relationship and shared with Christine’s mother the possibility that Christine’s poor weight gain might be a reflection of stress and exhaustion. This information was provided supportively and without judgment, and an appropriate intervention plan was provided. In addition, the pediatrician has the luxury to allow the case to evolve over time without exhausting the diagnostic laboratory and the family with 1 esoteric test after another without appropriate indication. Basic screening laboratory tests and others that might be indicated by a careful history and physical examination are all that are necessary.

This approach does not come naturally to the inexperienced clinician who must face his or her own anxiety when faced with a complex dilemma. The need for diagnostic certainty in the face of little supportive evidence is seductive. Nevertheless, the ability to “embrace complexity” to avoid premature diagnostic closure, to allow information to develop, and to consider new information carefully as it becomes available is a valuable trait and one worthy of practice.

**Daniel B. Kessler, MD**

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REFERENCES


Interim History

At the first follow-up visit, Christine’s weight had increased 1.2 ounces per day in response to more frequent nursing and formula supplementation. She returned to the pediatric office the following week for another weight check and again showed gains. What was more interesting was the information her mother shared at this visit. The mother’s sister, a second-year medical student visiting from another state, noticed that her sister had a “puffy” face and suggested the possibility of a “hormone imbalance.” Christine’s mother made an appointment with her doctor, who made a prompt biochemical diagnosis of Hashimoto’s thyroiditis (hypothyroid phase). Soon after thyroid replacement was initiated, Christine’s state, noticed that her sister had a “puffy” face and suggested the possibility of a “hormone imbalance.” Christine’s mother made an appointment with her doctor, who made a prompt biochemical diagnosis of Hashimoto’s thyroiditis (hypothyroid phase). Soon after thyroid replacement was initiated, Christine’s state, noticed that her sister had a “puffy” face and suggested the possibility of a “hormone imbalance.” Christine’s mother made an appointment with her doctor, who made a prompt biochemical diagnosis of Hashimoto’s thyroiditis (hypothyroid phase). Soon after thyroid replacement was initiated, Christine’s state, noticed that her sister had a “puffy” face and suggested the possibility of a “hormone imbalance.” Christine’s mother made an appointment with her doctor, who made a prompt biochemical diagnosis of Hashimoto’s thyroiditis (hypothyroid phase). Soon after thyroid replacement was initiated, Christine’s state,注意事项
and the infant’s growth and development were normal; however, it remains uncertain whether Christine escaped unharmed from this episode. Her mother may have had thyroid dysfunction during pregnancy as well. Increasing evidence indicates that hypothyroidism in pregnant women is associated with subtle intellectual impairment in their children. More specifically, hypothyroxinemia in the first trimester places a fetus at an increased risk for abnormal neuropsychological development. This may even occur with normal triiodothyronine and thyroid-stimulating hormone levels because maternal T4 is the sole fetal source of thyroid hormone during the first trimester. The presence of maternal thyroid peroxidase antibodies during pregnancy has also been associated with a 10-point lower IQ in offspring, adding to the evidence that low thyroid reserve as a result of autoimmune thyroiditis may have adverse effects during fetal life.9

Although undiagnosed hypothyroidism in a woman of childbearing age may have a significant impact on her future children, a reasonable screening program to detect low free thyroxine during early pregnancy may be difficult to achieve.9,11 Most women do not routinely see a physician before conceiving, so prevention of first trimester hypothyroxinemia by early detection and treatment may not be feasible. If screening is performed at the first prenatal visit, typically around 8 to 10 weeks gestation, by the time an abnormal screening test is confirmed, thyroid replacement may be initiated beyond the period in fetal life at which it is required for critical brain development.

**REFERENCES**


**Web Site Discussion**

The case summary for the Challenging Case was posted on the Developmental and Behavioral Pediatrics Web site (www.dppeds.org/list) and the Journal’s Web site (www.lww.com/DBP). Comments were solicited.

**Dipesh Navsaria, MPH, Physician Assistant/Medical Student, University of Illinois, Champaign**

I had a similar case to this last year in which a 4-month-old nursing infant stopped gaining weight and even began to slowly lose weight. After a negative laboratory evaluation and repeated weight checks, I asked a question that I probably should have asked more clearly the first time regarding maternal medications. A few weeks before the onset of poor growth, the mother’s obstetrician prescribed an oral contraceptive. The mother then noticed a reduction in her milk supply and discontinued the oral contraceptive after a few days. Subjectively, the mother reported that she felt her milk supply return. I suspect that the amount of breast milk remained low. In that this was her first child, she may not have accurately assessed her milk output. Formula supplementation was initiated and lactation was stimulated by giving the mother metoclopramide. Her breast milk output eventually returned. The baby perked right up, gained weight, and subsequently did well.

When the oral contraceptive was prescribed, the mother pointed out to the doctor that she was nursing and specifically asked if the oral contraceptive would interfere with nursing. She was reassured that it would not affect nursing. When I consulted with an obstetric colleague, I learned that the brand of oral contraceptive prescribed was known to interfere with lactation. I learned to always ask about oral contraceptive use—patients may not think of them as “medicine.”

**Editor’s note:** Oral contraceptives with estradiol are more likely to be associated with breast milk reduction. Those that include only a progesterone are less likely to affect lactation.

**Dr Martin T. Stein**

This case might be titled “A mother who had the wisdom to invite an attentive and informative sister to her home.” The pediatrician (admittedly the author and not too early in his pediatric career) observed the mother’s fatigue, sleep deprivation, and multiple environmental stressors, but he did not no-
tice the myxedema facial appearance. In fact, at the time, maternal hypothyroidism was not considered among potential organic causes for failure to thrive in a nursing infant. Similar to other examples in the ongoing education of a physician, since this initial case, other infants with early growth failure secondary to maternal hypothyroidism have been seen.

My sustained interest in the field of developmental and behavioral pediatrics comes from a recognition of 1 central element. Developmental-behavioral pediatrics focuses on the dynamic interactions between biological and psychological phenomena. We recognize the potential role of psychological and social factors in the child with an organic illness (eg, the importance of environmental factors in the treatment and outcome of children with asthma and attention-deficit hyperactivity disorder). At the same time, we also are attentive to possible biological contributors in the child with a behavioral or psychosomatic disorder (eg, the importance of considering occult constipation, lactose intolerance, giardia, or a urinary tract infection in a school-aged child with recurrent abdominal pain—a condition most often without a clear organic cause and often associated with challenging events in the child’s life or family conflict). A pediatrician’s training in biological medicine, child development, and behavioral pediatrics prepares him or her to analyze clinical situations similar to the current case with a comprehensive model.

Dr Kessler was not aware of the interim history that revealed the mother’s hypothyroid condition. His commentary is a fine example of a biopsychosocial approach to understanding the cause of Christine’s failure to thrive. On the biological side, he noted the importance of a knowledge about expected daily growth in a breastfeeding infant at this age. That “slower increase in weight can be particularly prominent between 3 and 12 months [in breastfed infants] and is of no concern in the otherwise healthy infant” is relatively new information from studies in the past decade. In addition, he emphasized the importance of interpreting growth charts correctly.

With the recognition that exclusively breastfed infants can show significant decrease in weight-for-age growth on the 1977 NCHS growth charts, Dr Kessler observed that the revised Centers for Disease Control and Prevention growth charts, generated with a higher proportion of breastfed infants, are a more accurate assessment of growth in these babies.

Both Drs Kessler and Hubbard emphasized the multiple psychosocial risk factors that may have contributed to Christine’s poor weight gain. The physiology of lactation is bound intimately to the environment of baby and mother. Christine’s pediatrician was also sensitive to these factors. She wisely made use of the initial office visit when she included a direct observation of nursing as a part of the assessment. In addition, Dr Kessler pointed out the importance of infant temperament in the assessment. Although we were not given information about Christine’s temperament, he observed that “passive, undemanding infants may fuss less and consume less than the required amount of calories needed for growth in this rapid growth phase of infancy.”

Most clinical situations similar to this case will not result in a diagnosis of maternal hypothyroidism. A more likely diagnosis in a similar situation might be maternal postpartum depression; the evidence in this case for that diagnosis was incomplete. It is a reminder, however, of the role of pediatricians to be sensitive to a mother’s mood and physical appearance at the time of office visits (especially in the early months after the birth of a baby). Emotional lability, withdrawn behavior, and signs of sleep deprivation provide clues to depression. An empathic statement, similar to the one by Christine’s pediatrician, that “You look exhausted. It must be really tough to care for 3 young children” provides an opportunity for further gathering of data. During some health-supervision visits, the effective therapeutic intervention (for mother and baby) is a timely referral of the mother for an evaluation and treatment of depression.

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Failure to Thrive in a 4-Month-Old Nursing Infant

Pediatrics 2004;114;1468
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