



INSUFFICIENT MILK SYNDROME: A CLINICAL OVERVIEW OF CAUSES, DIAGNOSIS, AND MANAGEMENT

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ABSTRACT Insufficient Milk Syndrome (IMS) is the genuine physiological inability to produce an adequate amount of breast milk to meet an infant's nutritional needs, a condition that is rare but can significantly affect maternal confidence and infant development. This narrative review examines the causes, diagnostic process, and management strategies associated with IMS, drawing on research from PubMed, WHO, and key lactation studies published over the past 15 years. True IMS is frequently associated with underlying biological factors, including insufficient glandular tissue, hormonal imbalances such as thyroid or prolactin disorders, retained placental fragments, and a history of breast surgeries. Accurate diagnosis requires a comprehensive evaluation to rule out common but modifiable issues, such as ineffective breastfeeding techniques, inadequate feeding frequency, and infant latching problems. Management of IMS involves a combination of interventions, including optimizing breastfeeding practices, prescribing galactagogues when appropriate, and offering psychosocial support to address the emotional impact on the mother. Differentiating between actual insufficient milk supply and perceived low milk supply is important, as the latter can often result from misunderstanding or lack of support and may be addressed with proper education and reassurance. A multidisciplinary approach—incorporating lactation consultants, paediatricians, and mental health professionals—can help improve breastfeeding outcomes and sustain the mother-infant bond. Addressing IMS through accurate diagnosis, individualized care, and integrated support systems is essential to ensure that mothers receive the necessary guidance to foster a positive and successful breastfeeding experience.

KEYWORDS : Insufficient Milk Syndrome, Breastfeeding, Lactation Failure, Milk Supply, Lactation Support

INTRODUCTION

Breastfeeding is universally acknowledged as the superior method for infant feeding, offering unmatched nutritional, immunological, and psychological advantages for both the infant and the mother. The World Health Organization (WHO) and UNICEF recommend exclusive breastfeeding for the first six months of life, followed by continued breastfeeding with appropriate complementary foods for up to two years or beyond.(1) Despite these recommendations and widespread public health campaigns, many mothers face challenges that lead to early weaning or mixed feeding. One of the most frequently cited reasons for discontinuing breastfeeding is the perception of an insufficient milk supply. (2,3)

While most cases of perceived low milk supply are attributed to modifiable factors such as poor latch, infrequent feeding, stress, or misinformation, a small subset of mothers experience a true physiological condition known as Insufficient Milk Syndrome (IMS). IMS refers to the genuine inability of a mother's body to produce enough breast milk to meet the nutritional demands of her infant, despite optimal breastfeeding techniques and support. This condition, although rare, can have profound consequences on infant growth, maternal well-being, and the overall breastfeeding experience.

The etiology of IMS is multifactorial. It is often associated with maternal anatomical or physiological conditions such as insufficient glandular tissue (hypoplasia), endocrine disorders (e.g., thyroid dysfunction, polycystic ovary syndrome), retained placental fragments, or a history of breast surgery. Unlike perceived insufficiency, which can usually be addressed through education and breastfeeding support, true IMS requires clinical evaluation, accurate diagnosis, and a comprehensive, individualized management plan. (4,6)

Diagnosing IMS is particularly challenging due to the overlap of symptoms with more common breastfeeding issues and the lack of standardized diagnostic criteria. Many healthcare providers may inadvertently overlook or mislabel IMS, leading to inappropriate advice or emotional distress for the mother. Additionally, cultural expectations and the idealization of breastfeeding can intensify feelings of guilt and failure in mothers who are unable to exclusively breastfeed (5), further underscoring the need for sensitive and evidence-based care.

Given its potential impact on maternal-infant health outcomes and the broader public health implications, IMS remains an underexplored and underdiagnosed condition in clinical practice. This research aims to explore the underlying causes, diagnostic challenges, and management strategies of Insufficient Milk Syndrome. By differentiating true IMS from perceived low milk supply and highlighting the importance of timely, multidisciplinary intervention,

this study seeks to contribute to more effective support systems for breastfeeding mothers and better health outcomes for their infants.

Objective

To provide a comprehensive overview of Insufficient Milk Syndrome, including its causes, diagnostic criteria, and management strategies, and to differentiate it from perceived low milk supply.

Methodology

A narrative review of current literature was conducted using databases such as PubMed and resources from the WHO. Key lactation-related studies published over the last 15 years were analysed to gather information on the causes, diagnosis, and management of IMS.

ETIOLOGY

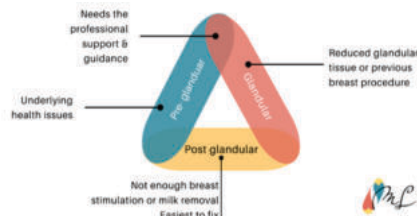


Figure 1: - Etiology of IMS, source: <https://www.mattoslactation.com/low-supply-causes>

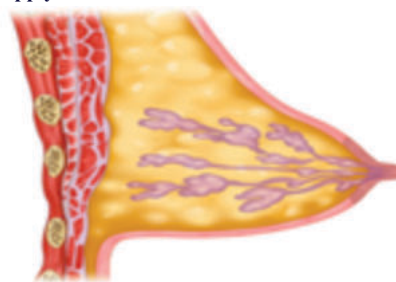


Figure -02: - IGT, Source :- <https://entokey.com/breastfeeding-evaluation-the-physical-exam/>

1. Insufficient Glandular Tissue (IGT)

It is also known as mammary hypoplasia, is a medical condition characterized by inadequate milk-producing glandular tissue in the breasts, resulting in low or absent breast milk production. This condition arises due to incomplete development of glandular tissue during adolescence, often leading to smaller or underdeveloped breasts. (4)

2. Hormonal Imbalances

Hormonal imbalances, particularly affecting prolactin, and thyroid hormones, can contribute to insufficient breast milk syndrome (also known as low milk supply). Conditions like polycystic ovary syndrome (PCOS), hypothyroidism, and Sheehan's syndrome affect hormonal pathways essential for milk synthesis and ejection. (5,7)

3. Retained Placental Fragments

Failure to expel the placenta completely post-delivery can impede the normal hormonal shift required for lactogenesis II, delaying or preventing full milk production. (7)

4. Breast Surgery or Trauma

Surgical interventions such as augmentation or reduction mammoplasty, particularly with periareolar incisions, may disrupt milk ducts and nerve supply, affecting milk production. (8). Injuries to the breast can damage milk ducts, which are responsible for transporting milk from the milk-producing tissue to the nipple. This damage can lead to decreased milk production or make it more difficult to empty the breasts during nursing, potentially reducing supply.

DIAGNOSIS

True Insufficient Milk Supply (IMS) is uncommon and should only be diagnosed after ruling out common, reversible factors that may affect lactation. (9) An accurate assessment is crucial and should be comprehensive, involving the following steps:

Table: Differential Diagnosis – Perceived vs True Insufficient Milk Syndrome

Feature	Perceived IMS	True IMS
Definition	Belief of not producing enough milk, despite normal supply	Actual physiological inability to produce adequate milk
Prevalence	Common	Rare (1–5% of mothers)
Breast Anatomy	Normal breast development	Often hypoplastic or asymmetric breasts
Hormonal Profile	Typically, normal	May show endocrine abnormalities (e.g., PCOS, thyroid issues)
Infant Weight Gain	Usually, adequate	Poor weight gain despite frequent feeding
Milk Transfer	Adequate with good latch and frequency	Poor milk transfer even with correct latch and technique
Feeding Frequency	Frequent feeding due to growth spurts, cluster feeding	Frequent feeding due to hunger from inadequate milk supply
Infant Output (Urine/Stool)	Normal urine and stool patterns	Reduced wet diapers, fewer stools
Breast Changes Postpartum	Noticeable engorgement, leaking, breast softening	Minimal changes, no engorgement, little/no leaking
Test Weighing Result	Normal milk intake observed	Inadequate milk intake observed
Response to Support	Improves with education and lactation counselling	Limited response to counselling alone
Need for Supplementation	Often avoidable with proper guidance	Often necessary and should be managed with SNS or appropriate formula
Psychological Factors	Anxiety, lack of confidence, societal pressure	Distress due to actual milk insufficiency, often with added guilt

(Source: Adapted from Neifert MR. Prevention of breastfeeding tragedies. *Pediatr Clin North Am*. 2001;48(2):273–97.)

MANAGEMENT

Effective management of true IMS requires a multi-pronged approach, addressing both physiological and behavioural aspects of lactation. The following interventions are commonly employed:

1. Lactation Counselling

Referral to a certified lactation consultant (International Board-Certified Lactation Consultant – IBCLC) is an essential first step in managing low milk supply. Lactation counselling helps:

- Assess and correct latch and positioning to ensure efficient milk transfer.
- Optimize feeding frequency and duration, ideally every 2–3 hours.
- Identify and address modifiable behavioural or environmental factors, such as stress, lack of support, or infrequent breastfeeding.

- Provide emotional support to the mother, which can positively influence hormonal responses involved in lactation (e.g., oxytocin release).

2. Stimulation and Expression

Milk production operates on a supply-and-demand principle, where increased milk removal signals the body to produce more. Key strategies include:

- Frequent breastfeeding or pumping: Aim for 8–12 sessions per day, including at night, especially in the early postpartum period. (11)
- Hospital-grade electric breast pumps: These are more effective than manual or personal-use pumps for establishing and maintaining milk supply.
- Double pumping: Simultaneously expressing milk from both breasts can enhance prolactin response and increase output.
- Hands-on pumping and breast massage: These techniques can improve milk flow and drainage, stimulating greater production.

3. Galactagogues

Galactagogues are substances that promote lactation, but their use should be individualized and medically supervised. Options include:

- Pharmacological Agents:
 - o Domperidone is commonly prescribed to increase prolactin levels by blocking dopamine receptors. (12)
 - o Metoclopramide is another option, though it carries a higher risk of side effects such as fatigue or depression.
- Herbal supplements:
 - o Fenugreek, blessed thistle, milk thistle, and fennel are popular herbal galactagogues. (13)
 - o Their effectiveness is anecdotal in many cases, and safety data is limited.

Caution: Galactagogues should not replace foundational interventions like proper breastfeeding technique or regular stimulation and should only be used when indicated.

4. Supplemental Nursing Systems (SNS)

A Supplemental Nursing System is a tool designed to support breastfeeding in mothers with low milk supply by:

- Supplemental milk, whether expressed breast milk or formula, may be administered through a thin tube affixed to the mother's nipple during breastfeeding.
- Encouraging continued suckling at the breast, which maintains the infant's association with breastfeeding and stimulates the mother's milk production.
- Reducing the need for bottle-feeding, which may interfere with breastfeeding techniques (nipple confusion). This method supports both nutritional intake for the infant and ongoing breast stimulation for the mother.

5. Psychosocial Support

True Insufficient Milk Supply (IMS) can lead to significant emotional distress for mothers, often manifesting as guilt, anxiety, frustration, or a perceived sense of failure. Addressing these psychological impacts is a critical component of comprehensive care.

- Empathetic counselling by healthcare providers is essential. Clinicians should normalize the mother's experience, validate her efforts, and avoid placing undue pressure to breastfeed at all costs.
- Reinforcement of maternal-infant bonding should be prioritized, emphasizing that nurturing, love, and responsiveness are not dependent on the mode of feeding. The emotional connection between mother and baby is sustained through consistent care, touch, eye contact, and interaction.
- Promoting involvement in peer support groups, either face-to-face or virtual, can offer mothers shared experiences, emotional validation, and practical advice.
- Where needed, referral to mental health professionals (e.g., psychologists or perinatal counsellors) may be beneficial, particularly in cases of postpartum depression or significant anxiety.
- Educational materials and community resources should be provided to empower the mother with informed choices and reduce feelings of isolation.

Holistic support enhances maternal confidence, strengthens the caregiver-infant relationship, and promotes better maternal and infant outcomes—regardless of breastfeeding status. (14)

CONCLUSION

Insufficient Milk Syndrome (IMS), while rare, can have profound implications for both infant nutrition and maternal psychological well-

being. Accurate diagnosis—based on thorough clinical assessment and the exclusion of reversible causes—is essential for appropriate management.

Effective care involves, Skilled lactation support, including individualized counselling and breastfeeding education. Evidence-based interventions such as stimulation techniques, use of galactagogues, and supportive feeding aids. Holistic psychosocial support, recognizing the emotional challenges associated with IMS.

By adopting a comprehensive, mother-centred approach, healthcare providers can empower women to navigate breastfeeding challenges with confidence and compassion, (15,16) supporting positive feeding experiences and optimal maternal-infant health outcomes.

Existing Knowledge on the Subject

Breastfeeding is globally recognized as the gold standard of infant nutrition due to its unmatched health, immunological, and psychological benefits. The World Health Organization (WHO) and UNICEF recommend exclusive breastfeeding for the first six months of life, followed by continued breastfeeding with complementary feeding up to two years or beyond [1].

One of the most frequently cited reasons for early supplementation or cessation of breastfeeding is the perception of insufficient milk supply [2]. This perceived insufficiency often stems from misunderstanding infant behaviour, such as frequent feeding or fussiness, and may be exacerbated by sociocultural beliefs, lack of breastfeeding education, and early formula supplementation [3,4].

True Insufficient Milk Syndrome (IMS), in contrast, is rare and affects approximately 1–5% of mothers [5]. It is characterized by the physiological inability to produce enough milk, often due to identifiable medical conditions like breast hypoplasia, retained placental fragments, endocrine dysfunctions, or prior breast surgeries [6,7]. When unrecognized or misdiagnosed, true IMS can lead to adverse outcomes, including poor infant growth, early weaning, and maternal distress [7].

Contributions of this Paper

This review contributes to clinical practice and breastfeeding support by clearly distinguishing true IMS from perceived insufficient milk supply—a distinction vital for appropriate management[2]. It offers a comprehensive overview of the etiology of true IMS, encompassing endocrine disorders, glandular tissue insufficiency, retained placental tissue, and the effects of breast surgeries. The paper presents evidence-based diagnostic methods, including maternal history, physical examination, infant output monitoring, and breastfeeding assessments [9,10].

Importantly, it emphasizes the need for a multidisciplinary care model that incorporates paediatricians, obstetricians, endocrinologists, lactation consultants, and mental health professionals. Such coordinated efforts are essential in addressing the physiological and emotional aspects of IMS [11,12].

By synthesizing current evidence and identifying gaps in recognition and management, this paper supports the development of better diagnostic tools, targeted interventions, and enhanced support systems for breastfeeding women.

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