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**OBGYN.net** is pleased to announce a new interview section with Advisory Board member Lesa Childers. Childers is a PCOSupport Chapter Development Coordinator and is the founder of WNC PCOSupport. A great advocate for PCOS education, Childers meets many doctors and medical professionals in her work with PCOSupport. This section will highlight different health professionals discussing their work related to Polycystic Ovary Syndrome.

Hello Everyone:

I am excited to have the opportunity to speak with Lisa Marasco, IBCLC about her research regarding a possible link between PCOS and Breastfeeding difficulties. In my work as a PCOSupport coordinator and as a new mother, I have met several with PCOS who have expressed concerns about difficulty breastfeeding related to low milk supply. While many women with PCOS apparently have no problems breastfeeding, my own curiosity regarding a possible link was peaked when I personally was unsuccessful at breastfeeding my daughter. While at the PCOSupport conference in San Diego this year, I heard of Marasco’s study and contacted her for more information. She has kindly agreed to be my first interviewee for this new **OBGYN.net** series.

**Tell me something about your professional background**

I am an International Board Certified Lactation Consultant (IBCLC) in private practice. I've been working with breastfeeding for 15 years, the last 7 professionally. I am also just completing graduate work in human development with specialization in lactation.

**I have been told that anybody can breastfeed, is this true?**

It is interesting that in the mammalian kingdom, lactation failure due to insufficient milk production is a rare if not unknown phenomena. Yet, it is becoming clear that among humans, there are a small percentage who have not been able to make enough milk to support a baby; current estimates run between 2 and 5%. Among the factors I listed above, most are avoidable and/or reversible. The overall incidence of primary supply failure (no other known cause) should be small, but in my opinion seems to be inexplicably rising.

**What got you interested in PCOS and possible breastfeeding problems?**

Three years ago, I had two mothers present back-to-back within a week's time with milk supply failure. I had noted in the maternal health history that one had been diagnosed as PCOS, and the other as Stein-Leventhal. At the time I did not know much about either, but intrigued, I began to do research and discovered that they are essentially the same thing. This led me into deeper research as to the causes and hormonal issues of PCOS in the hopes of identifying a common underlying pathology, as well as a potential treatment.

**What is the hypothesized incidence of breastfeeding problems in women with PCOS, and how does that compare to the non-PCOS population?**

In a recent casual survey of mothers (n=39) from two internet PCO support groups, 67% reported making enough milk while 33% had an insufficient supply. Of the poor production group, 67% produced very little at all. Interestingly, 1 out of 5 mothers in the sufficient supply group complained
of problematic overproduction.

In the general population, it has been variously estimated that between 2 and 15% of all women are unable to produce enough milk. Most experts in the lactation field believe the percentage to be less than 5%.

Tell me about your research and how you are doing the study.

This is my second level of research on the issue of PCOS and milk supply, and will be summarized as my master's thesis. The first level involved case studies and hypotheses as to the potential etiologies of the milk supply failures, and was published this past May in the Journal of Human Lactation.

My current study is attempting to take the research a step further by taking a detailed history on mothers with PCOS who have experienced unexplained milk supply failures, preferably as diagnosed by qualified lactation consultants. I am collecting data on each mother's PCOS hormonal and symptomatic profile, her past lactation history, the health and lactation history of her close relatives, and her breast growth and shape history through pregnancy. From this I am hoping to perhaps identify some common factors that can help pinpoint specific issues more accurately. In the future I would like to conduct a full-scale third level that would be a prospective study of identified mothers with PCOS.

If it turns out that to be true that PCOS women have more lactation problems, what is the possible endocrine mechanism?

There are several different ways that PCOS could potentially interfere with lactation. Breast development largely occurs during puberty and pregnancy as the result of estrogen, progesterone, and during pregnancy, prolactin. Estrogen mediates ductal growth, while progesterone mediates alveolar growth. It is well known that many if not all PCOS women are deficient in progesterone; depending upon the onset of PCOS, there is a hypothetical potential for disruption of alveolar growth during adolescence, not to mention during pregnancy. A recent case study in the Journal of Human Lactation noted a mother who was diagnosed with lactation failure due to insufficient mammary tissue who developed more breast tissue with her second successful pregnancy after treatment of secondary infertility with pre- and post-conception progesterone therapy; she went on to produce a full supply of milk. This case seems to lend credence to the progesterone deficiency theory.

In addition to the progesterone contribution to breast development, there are also the hormones estrogen and prolactin. While estrogen levels can be high in the peripheral tissues of some PCOS women, it has also been noted that androgens, which are generally high with PCOS, can down-regulate both estrogen and prolactin receptors. In essence, a could produce enough hormones but not have enough receptors to utilize them, thus limiting their influence upon breast tissue.

Another level of potential disruption lies in the lactation process itself. It is believed that the drop in progesterone at parturition serves to initiate production of mature milk. As this occurs, a process takes over which is driven by two major hormones, prolactin (affects production) and oxytocin (affects delivery). Prolactin receptors begin to develop during pregnancy, and then continue to multiply during the early postpartum period in proportion to the frequency of nipple stimulation. If receptor development was inhibited, the effectiveness of the circulating hormone would be diminished, thus limiting milk production.

Estrogen is a known inhibitor of milk production, especially in the early postpartum period. If the receptors are not down-regulated and the circulating estrogen levels are high, this too could potentially disrupt lactation.

Insulin also plays a vital, though less well-known, role in milk production. Women with uncontrolled will not make enough milk. Given this fact, what might be the effect of insulin resistance, which appears to be a significant factor in PCOS, upon lactation? The breast is a sensitive target organ for insulin; if insulin cannot be taken in quickly and efficiently enough, this too could hypothetically cause lactation problems.
What is the macronutrient composition of human milk in women with PCOS compared to women without PCOS?

The composition of milk from women with PCOS has not been studied.

Could the potentially high carbohydrate composition of human breast milk contribute to insulin resistance in children?

This is highly unlikely. Mammalian milk is species-specific, providing the exact nutrients necessary for optimal growth of each species. The majority of the carbohydrate in human milk is in the form of lactose, which serves to enhance calcium absorption as well as provide a ready energy source for the rapidly growing infant brain. It is interesting to note that human babies make large amounts of lactase, enzymes which break down lactose, for the first couple of years of life, after which the production of these enzymes diminishes greatly. This suggests that lactose is an important nutritional source for the human infant, but not for older humans.

This raises some intriguing questions. If we are not built to process a lot of lactose after infancy, what might be the ramifications of a diet high in dairy? It is well known that many populations are lactose intolerant; we also know that early introduction of cow's milk has been associated with an increased incidence of . Might diets heavy in dairy/lactose contribute to the development of insulin resistance which seems to be becoming almost epidemic? The question of the healthiness of carbohydrates in general in the human diet is a good one, but must also be balanced out with nature's intended nutritional blueprint over our lifespan, during which our needs change.

What are the usual reasons for low milk supply in new mothers?

The number one cause of low milk supply is simple "mismanagement", meaning baby is not latched properly over the long term, or mother and baby are not breastfeeding often enough, resulting in inadequate stimulation for good milk production. Close behind is "perceived insufficient milk supply", which refers to the cultural perceptions that cause mothers to conclude that they are not making enough milk when indeed they are and can. This misperception often occurs during growth spurts, or from the ignorant and worrisome comments of friends and relatives about how often baby "should" be eating or how long baby "should" be sleeping at a particular age, resulting in a decision to supplement that causes baby to demand less and thus milk production to truly drop.

Beyond this, hypothyroidism, uncontrolled diabetes, or more rarely retained placental fragments or severe postpartum hemorrhage, can also cause low milk supply, as can birth control pills and shots, especially when started early on.

How does mother's diet affect milk production?

A mother who is well-nourished will usually produce abundant milk, but even a less well-nourished woman will generally produce enough milk to sustain her infant. A mother's body puts on an average 5-10 pounds of adipose tissue during pregnancy which is intended as a source of nutrients and energy if the food supply is scarce. Thus, though the production may be lower in times of scarcity, mothers should still be able to make enough milk to support their infant, given an adequate supply of fluids.

What is the composition of human milk (%carbohydrate, protein, fat) compared to non-human primate breast milk?

Human milk is approximately 4% fat, .9% protein, and 7% carbohydrate (mainly lactose), whereas baboon milk is approximately 5% fat, 1.6% protein, and 7.3% carbohydrate.

Does breast size matter in relation to breastfeeding and milk supply?

Generally speaking, no. I've seen moms with small breasts produce copious amounts of milk. For the most part, breast size mostly determines storage capacity, not potential milk production. Women
with large breasts tend to produce milk at slower rates since they can store a lot, whereas women
with small breasts will produce milk at faster rates in order to meet the needs of the infant, who will
"drain the tanks" quickly. The difference usually shows up as a baby who takes "large meals" less
often, versus a baby who takes "smaller meals" more often. If nature is allowed to take its course
and baby feeds as often as he needs to, both mothers usually can make enough milk to feed their
babies.

What is breast hypoplasia and what are the causes?

Breast hypoplasia is the technical term referring to underdevelopment of the breast. We also often
refer to this as "insufficient mammary tissue", because it is the inadequate development of the
glandular tissue that is a problem more than mere size. Hypoplastic breasts can vary in cup size but
often have an "empty sac" look to them, rather than the normal filling out of the breast. It is not
unusual to see one breast markedly larger than the other, more than the usual small asymmetry.

There are some rare genetic problems such as Poland's syndrome than are related to breast
hypoplasia, but they usually involve deficiencies of the underlying pectoral muscles. When we
discuss the phenomena of insufficient mammary tissue, these rare syndromes have been ruled out,
and unfortunately we do not yet have answers to what might be the cause of the remaining cases of
hypoplasia. It does seem feasible that, since hormones are responsible for breast growth during
adolescence and pregnancy, some kind of hormonal problem may be involved; however, we have
not found any specific correlations to date.

What are your suggestions to postpartum mothers who are having difficulty with
breastfeeding?

All mothers should be aware of their community breastfeeding resources, and they should not
hesitate to contact a qualified counselor if they are having problems. I would strongly encourage
women who have had past health or fertility problems to line up a professional lactation consultant,
preferably IBCLC, in advance, and to arrange for a consultation at the first sign of possible problems.
Early intervention can be very important in some cases.

Can other women with PCOS join the study?

Though my thesis will be finalized soon, I will continue to collect and collate responses to my
questionnaire. Women with PCOS who would like to participate in future studies (not necessarily
mine) can register at a newly established website: http://neonatal.ttuhs.edu/lactreg/. Researchers
from all over the world will have potential access to this database, which will hopefully speed up
studies on lactation-related issues, including those that touch moms with PCOS.

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