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Annals of Nursing and Practice

Short Communication

An Ethical Dilemma: Should Recommending Antenatal Expressing and Storing of Colostrum Continue?

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Submitted: 15 November 2022

Accepted: 13 December 2022

Published: 16 December 2022

ISSN: 2379-9501

INTRODUCTION

Forster et al. [1], contend that the practice of recommending antenatal expressing and storing of colostrum by mothers with Type 1 diabetes should cease until its efficacy can be tested in a randomised controlled trial (RCT). This contention raises an ethical dilemma. To undertake a RCT, researchers would require a control group of mothers who would not be educated about how to express and store their colostrum. The hypoglycaemic infants of these mothers would need to be given artificial milk based on cow's milk, with all its proven risks. An additional ethical consideration would be that midwives and other health professionals would need to decide whether or not to continue a practice that has not been proven harmful, but has immunological benefits to neonates.

In considering whether antenatal expression and storing of colostrum by pregnant Type 1 diabetic women should continue, a number of criteria need to be assessed including: the original reason for implementing the procedure; the immunological value of colostrum in preventing autoimmunity and Type 1 diabetes in the offspring; the differences in milk that women produce during pregnancy compared to colostrum; the importance of an extra glucose source for babies of hyperinsulinaemic mothers; the likelihood of nipple stimulation inducing labour; and the question of whether the women find the procedure a positive experience.

The practice of harvesting colostrum was instituted so that hypoglycaemic infants of insulin-dependent diabetic mothers would not receive cow's milk formula in the place of colostrum as their first nutrition after birth. A number of studies have demonstrated that receiving oral fluids other than colostrum at birth carries potential life-long health risks [2-5]. Cavallo [6], and co-workers hypothesised that early exposure to cow's milk protein triggered the gut immune system to the later development of beta-cell autoimmunity, a cellular and humoral anti-beta casein immune response that cross-reacted with a beta-cell antigen in the pancreas leading to cellular damage in the pancreas and Type 1 diabetes. On reviewing these studies, Vaarala [7], suggested that, for the prevention of Type 1 diabetes, infants with a genetic risk of diabetes should avoid treatment that will interfere with mucosal immunity, such as the early introduction of cows' milk (CM) formula.

Colostrum is known to be the vitally important first food for all mammalian offspring. As Hanson states in *Immunobiology of Human Milk*:

The immune defence against potentially harmful microbes is limited, but develops very rapidly after birth. Human milk contains numerous factors that protect the baby via its mucosal membranes where the microbial exposure takes place (2004:19).

The practice of having pregnant women with Type 1 diabetes express and store their colostrum daily from 34 weeks originally began based on the knowledge that over an extended period of time (53 days), breast secretions from non-puerperal women contain comparative levels of lactose, protein and alpha-lactalbumin as colostrum collected over a shorter period of time [8]. Therefore, the originator of antenatal expressing and storing of colostrum believed that it would be a safe and protective fluid for a neonate who became hypoglycaemic.

Over the past ten years, the proportion of infants receiving uninterrupted skin-to-skin contact after birth has increased. This contact is especially important for babies of mothers with Type 1 diabetes. Uninterrupted skin-to-skin contact between the mother and her infant is known to enhance the metabolism of brown adipose tissue and the occurrence of gluconeogenesis and ketogenesis that decrease the likelihood of hypoglycaemia [9]. In late foetal and early neonatal life, ketone bodies and lactate levels increase as fatty acids are broken down as an alternative fuel to glucose. However, the metabolism in a baby of a mother with hyperinsulinaemia is altered and in this situation the alternative glucose source for these neonates needs to be extra colostrum. Also, clinicians suggest that — providing there is good clinical evaluation of arousal level, tone, temperature, respirations and colour — taking blood for blood glucose levels before 90 minutes in an asympytomatic neonate is unnecessary as 75–90 minutes

following birth is a period when there is a normal nadir of blood glucose levels [10,11].

There is a misconception that the nipple stimulation experienced by the pregnant woman while expressing colostrum may induce premature labour. Nipple stimulation, or any other activity that is a precursor for oxytocin release including eating (particularly foods with phenyethylamines such as chocolate), kissing, hugging, masturbation and sexual intercourse will only induce labour if there are sufficient oxytocin receptors in the myometrium. Cox [12], reviewed a group of studies [13-15], in which pregnant women experienced varying but long periods of nipple stimulation (30 and 110 minutes). None of the studies showed significant effects in altering the Bishop's score or inducing labour. Cox [12], also reviewed a study by Moscone and Moore [16], of 57 women who had continued to breastfeed during pregnancy. The infants born to these mothers were healthy and appropriate for gestational age.

In a pilot study by Forster et al. [1], 95% of insulin-dependent women with diabetes (n = 40), when questioned 6 weeks after the birth of their babies, were positive about their antenatal experience of expressing and storing their colostrum. These women asserted that they would repeat the practice in a subsequent pregnancy if it was found to be beneficial [17].

Considering that antenatal expression and storage of colostrum by pregnant Type 1 diabetic women gives their babies an extra amount of fluid that biochemically compares with colostrum if needed for hypoglycaemia, and that nipple stimulation has not been shown to induce labour, the practice should continue and women should be educated about this easy, positive and empowering practice.

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