

## Breastfeeding for diabetes prevention

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### Abstract

Breastfeeding has been consistently observed to improve metabolism in mothers and their offspring. Apart from mother child bonding and nutritional benefits; it is associated with a decreased risk of acquiring metabolic syndrome and type 2 diabetes mellitus (T2DM) in mothers, obesity and type 1 diabetes mellitus (T1DM) in their children. Early initiation and exclusive breastfeeding should therefore be highly encouraged and strongly supported.

**Keywords:** Breastfeeding, Diabetes, Metabolic syndrome, Obesity.

### Introduction

Breastfeeding is a divine physiology at the inception of life outside the mother's womb, the benefits of which cannot be overstated. Diabetes is a common problem worldwide and frequently becomes an issue in relation to breastfeeding. There are undoubtedly multiple benefits of breastfeeding; for instance, nursing mothers have better glucose control and lowered insulin requirements and breastfed babies are less likely to develop obesity and diabetes in future.<sup>1-3</sup> Breastfeeding has also been associated with a reduced risk of developing metabolic syndrome in women with gestational diabetes mellitus (GDM),<sup>4</sup> and the risk of their offspring becoming overweight or obese.<sup>5</sup> Apart from metabolic issues surrounding lactation and glucose control, there also exist in the context of diabetes, various bio-psychosocial challenges to breastfeeding which require a holistic approach.<sup>6</sup>

### Risk of Diabetes Post-Partum

Prevention of diabetes or Impaired Glucose Tolerance (IGT) is of paramount importance. It is valuable to identify who is at high risk of developing diabetes postpartum. Mothers who are overweight, have a positive family history, poor physical activity and nutrition and who used medications to control GDM during pregnancy are at greater risk of developing diabetes later.<sup>7,8</sup> While Insulin regulates initiation and maintenance of lactation and diabetes appears to slow milk production in the early days

after delivery, overweight mothers are more unsuccessful with breastfeeding compared to women of normal weight.<sup>9,10</sup> Failure of breast milk will necessitate infant formula feeding, in which the milk protein is associated with the risk of developing obesity and both type 1 and 2 diabetes in the child.<sup>11-13</sup>

### Breastfeeding and glucose regulation

GDM mothers, particularly who are obese or required insulin for treatment during pregnancy tend to have problems with breast feeding initiation and require earlier weaning.<sup>14,15</sup> Breast feeding can improve metabolic function by various mechanisms. Lactogenesis requires glucose uptake, uses non-insulin mediated pathway, attenuates hyperinsulinaemia and promotes lipid utilization. Prolactin increases beta cell proliferation, beta cell mass and expression of menin. Lactation promotes energy expenditure, emotional well being and reduces stress.<sup>16,17</sup> In GDM mothers, glucose tolerance improves with breastfeeding, evidenced by drop in glucose levels during Oral Glucose Tolerance Test (OGTT) following breastfeeding.<sup>18</sup> A study of more than 150 000 nurses in the USA has shown that each year of lifetime breastfeeding lowers a woman's risk of diabetes by 15% which lasts for up to 15 years after the woman's last childbirth.<sup>2,19</sup> In a recent study in South China, breastfeeding for longer than 6 months was inversely associated with metabolic syndrome in children.<sup>20</sup>

### Status of breastfeeding

Cultural norms surrounding breastfeeding have changed dramatically over the past century. Breastfeeding initiation fell from 70% in the early 1990s to 22% in 1972; again the rates have risen to 77% in 2010. Although more mothers initiate breastfeeding, they do not continue as long as they desire.<sup>21</sup> While physiological factors like suckling response, large breasts and nursery admissions separating neonate and mother delay breastfeeding initiation,<sup>16</sup> the psycho-social and ethno-cultural barriers should also be considered. In South Asian regions, women who must return to work to support their families struggle to maintain their milk supply. Due to lack of knowledge, fear of transmission of diabetes to the child and personal reasons women choose to bottle feed with formula milk completely.

### Management approach

The management approach for diabetes prevention

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through breastfeeding essentially centers on encouraging and supporting early initiation and exclusive breastfeeding in all mothers, particularly with GDM or those with high risk profile. Health education about diabetes and counseling the benefits and anticipated barriers to breastfeeding to increase the knowledge, attitude and practice (KAP) should begin in the antenatal period; and rigorously discussed by the end of third trimester to explore, discuss and dispel the doubts and myths.<sup>6</sup> Maternal knowledge about infant health benefits, and comfort with breastfeeding in social settings is directly related to intentions to breastfeed; prenatal interventions to address these issues should increase exclusive breastfeeding intention and duration.<sup>22</sup> Mass awareness programs can also be conducted in occasions like World Breastfeeding Week, August 1-7.

Integrated care should ensure care of mother and child, lactation and endocrinology support as needed. Obstetricians should assist mothers to make an informed decision, offer anticipatory guidance, support lactation, evaluate and treat possible complications.<sup>21</sup> Proper breast examination should be ensured and mothers should be assured of adequate breastfeeding by providing knowledge on information like adequate maternal- infant interaction during feeding, drip milk from contralateral breast during feeding, baby satisfaction/adequate sleep, urine void, weight gain, etc.<sup>6,23</sup> Lifestyle modification, medical nutrition therapy, screening for complications, and overall aspect of comprehensive diabetes care should be followed in all GDM mothers. Drug interactions should be kept in mind in relation to lactation. In women requiring drugs for control, insulin remains the safest option during lactation while metformin and glibenclamide are possible alternatives.<sup>24,25</sup>

Babies who are born to GDM or diabetic mothers may have fluctuating blood glucose levels and are susceptible to hypoglycaemia after birth as they continue to produce excess insulin but no longer receive a steady supply of glucose from the mother. Careful monitoring of the baby's blood glucose and frequent breastfeeding are therefore very important.<sup>2</sup> Baby-friendly policies should be practiced and breast feeding should be initiated as soon as possible, expressed breastmilk (EBM) should be provided to neonates who are admitted in nursery. Early expression and feeding helps to ensure adequacy of lactation and prevention of breast engorgement.<sup>6</sup>

## Conclusion

Breastfeeding has multiple benefits including the

mother-child bond, vital child nutrition and several beneficial metabolic effects in both mother and child. In the context of diabetes, breastfeeding mothers have improved glucose tolerance achieved through energy expenditure, emotional well being and reduced stress, which lowers a woman's risk of diabetes. Children who are early and exclusive breastfeed are less likely to suffer from obesity and diabetes in the future. Breast feeding should be encouraged, supported and promoted strongly in all women, particularly those with GDM in order to improve long term health outcomes. It is imperative to know that there are physical, physiological, psycho-social and ethno-cultural barriers to breastfeeding. The GDM care team, including obstetricians, endocrinologists and dieticians should be aware of barriers and misconceptions related to breastfeeding, and work closely with mothers to encourage breastfeeding.

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