

## **THE EFFECT OF INFANT GENDER ON THE QUALITY OF BREAST MILK**

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### **INTRODUCTION:**

In the early Islamic era ,there was a historical story of two pregnant ladies were delivered in the same place ,during night, one lady gave birth to a male baby and the other gave birth to a female baby and each lady claimed that the male baby was her son and this problem was solved by the authority at that time by measuring the weight of an equal size of breast milk from each lady and they gave the male to the lady of the heavier breast milk<sup>1</sup>.

Human milk is uniquely adopted to the infants needs and is the most appropriate milk for the human infant .Breast feeding is associated with fewer feeding difficulties incident to allergy and / or to bovine milk <sup>2,3,4</sup>.Breast fed infants also appear to have a lower frequency of certain allergic and chronic diseases in latter life than formula fed infants. Human milk contains bacterial and viral antibodies ,including relatively high concentrations of secretory immunoglobulin A, that prevent microorganisms from adhering to the intestinal mucosa . It also contains substances that inhibit the growth of many common viruses as well as specific antibodies that are thought to provide local gastrointestinal immunity against organisms entering the body via this route. These factors probably account ,for the lower prevalence of diarrhea , otitis media ,pneumonia ,bacteremia and meningitis during the first year of life in infants who are breast fed exclusively compared with those formula fed for the first four months of life <sup>2,3,5,6</sup>.Macrophages in human milk may synthesize complement ,lysozyme and lactoferrin which has an inhibitory effect on the growth of Escherichia coli in the intestine <sup>2,5,6,7,8</sup> .The lower Ph of the stool of breast fed infants is thought to contribute

to the favorable intestinal flora which protect against infections caused by some species of E- coli .Human milk also contains bile salt stimulated lipase , which kills Giardia lambilia and Entameba histolytica . Breast milk provides the wright balance of nutrients to help an infant growth in to a strong and a healthy toddler and contains important fatty acids that help an infants brain development and increase infants cognitive skills <sup>5,9,10</sup> .

Sodium is the dominant cation of extra cellular fluid , and it is the principal determinant of extra cellular osmlality and therefore is necessary for the maintenance of intravascular volume and the low intracellular sodium concentration ,approximately 10 mEq / L ,is maintained by sodium ,potassium – ATPase which exchange intracellular sodium for potassium .The intracellular concentration of potassium approximately 150mEq /L ,is much higher than plasma concentration and the majority of body potassium is contained in muscle ,as muscle mass increase , there is increase in body potassium <sup>11</sup> .

The majority of extra cellular potassium is in bone , less than 1% of total body potassium is in plasma and it is necessary for the electrical responsiveness of nerve and muscle cells and for the contractility of cardiac skeletal and smooth muscles.

Glucocorticosteroids inhibit osteoblastic activity by decreasing the number and activity of osteoblasts and to a lesser extent leading to low bone turnover with an overall negative balance and effect of decreasing serum calcium <sup>12</sup> .

Most phosphorus is in bone or intracellular ,with less than1% in plasma and phosphates is the most plentiful intracellular anion ,although the majority is part of a larger compound ( ATP) <sup>11</sup> .

### **THE AIMS :**

To prove the effect of infants gender on the quality of breast milk and the difference in the weight , specific gravity and concentration of sodium , potassium ,calcium and phosphorus between the breast milk of mothers lactating male babies and breast milk of mothers lactating female babies .

### **MATERIAL AND METHODS:**

Fore breast milk was collected from two hundred lactating mothers who were admitted with their babies to pediatrics and maternity wards and from the out patient clinic in Babylon maternity and pediatrics teaching hospital from February 2008- June 2008 and according to the age and sex of the breast feeding babies , the lactating mothers were divided in to two groups, one hundred mothers with male breast feeding and another one hundred female breast feeding and according to the age of the breast fed babies, each group were subdivided in two groups, fifty lactating mothers their babies age is equal or less than fifteen days and another fifty lactating mothers their babies age more than fifteen days old .

Information's were taken from the lactating mothers about the age and sex of their babies and the mothers age , weight and height to exclude the sever under nourished mothers . Each milk sample given a number and send to the laboratory ,where an equal size was taken by the same one milliliter pipette to measure the weight by a sensitive weigh-beem (Sartorius BL210S) type with four zero after the point (0. 0000) and detect the specific gravity by dividing the mean weight of breast milk samples to the weight of one milliliter of distil water because the specific gravity of fluid is the ratio of mass per unit volume to the mass per unit volume of water at 4 C <sup>13</sup> .

The concentrations of sodium ,potassium were estimated by flam photometry, calcium was estimated by titration with EDTA and phosphorus was estimated by UV- Visible

spectroscopy , in 109 breast milk samples ,52 from mothers lactating male baby and 57 from mothers lactating female baby .All the samples were estimated after being digested to remove the organic substances .

The paired t- test (p) value, correlation coefficient & analysis of variance were used to compare between the two groups .

### **RESULTS:**

There was a significant difference between the mean weight of breast milk of 100 mothers lactating male babies (0.9861 gm) and the mean weight of breast milk of 100 mothers lactating female babies (0.9541 gm) , $P < 0.05$  as shown in table 1 .There was apparent difference between the mean weight of breast milk from 50 mothers lactating male babies their age range from 1-15 days (0.9382 gm) and the mean weight of breast milk from 50 mothers lactating female babies of the same age group (0.9083 gm) .Also there was apparent difference between the mean weight of breast milk from 50 mothers lactating male babies their age more than 15 days (0.9957 gm) and the mean weight of breast milk from 50 mothers lactating female babies their age more than 15 days (0.9782 gm) as shown in table 2.

There was a significant difference between the mean specific gravity of breast milk from one hundred mother lactating male baby (0.9893 ) and the specific gravity of milk from the same number of mothers but lactating a female baby (0.9553), $P < 0.05$  as shown in table 3. There was apparent difference between the specific gravity of breast milk from 50 mothers lactating male baby their age 1-15 days (0.9408) and the specific gravity of milk from the same number and age of their babies but lactating a female baby (0.9103) .

Also the specific gravity of mature milk (>15days)from 50 mothers lactating male baby (0.9979) and the specific gravity of mature milk from 50 mothers lactating female baby (0.9803) as shown in table 4.

There was a significant difference in the mean calcium concentration in breast milk of mothers lactating male baby and breast milk of mothers lactating female baby and the value was (28.28 mg /dl) and (31.22mg/dl ) respectively ( p. <0.05) .The mean concentration of sodium in milk of mothers lactating male baby and of mothers lactating female baby were (23.26 mEq/L) and( 29.06mEq/L ) respectively .There was apparent difference in the mean concentration of phosphorus in breast milk of mothers lactating male baby (29.73mg/dl) and breast milk of mothers lactating female baby (25.54mg/dl).Also there was apparent difference in the mean concentration of potassium in breast milk of mothers lactating male baby (16.94mEq/L) and breast milk of mothers lactating female baby (13.28mEq/L) as shown in table 5.

**Table 1: The difference in the mean weight of breast milk of mother lactating male and female babies**

sex	number	Mean weight(gm)	P value
Male	100	0.9861	<0.05
Female	100	0.9541	<0.05

**Table 2: The difference in the mean weight of breast milk in relation to sex and age of the breast fed baby**

Sex	Number	Age (days)	Mean weight (gm)	P value
Male	50	1-15	0.9382	>0.05
Female	50	1-15	0.9083	>0.05
Male	50	>15	0.9957	>0.05
Female	50	>15	0.9782	>0.05

**Table 3: The difference in the mean specific gravity of breast milk of mother lactating male and female babies**

Sex	Number	Mean specific gravity±S.D.	P value
Male	100	0.9893±0.0872	<0.05
Female	100	0.9553±0.1289	<0.05

**Table 4: The difference in the mean specific gravity of breast milk in relation to sex and age of the breast fed baby**

Sex	Number	Age (days)	Specific gravity	P value
Male	50	1-15	0.9408	>0.05
Female	50	1-15	0.9103	>0.05
Male	50	>15	0.9979	>0.05
Female	50	>15	0.9803	>0.05

**Table 5: The mean concentration level of minerals in breast milk in relation to the sex of breast fed babies**

Mineral	Sex	Number	Mean Conc.	P value
Sodium	Male	52	23.26 meq/L	>0.05
	Female	57	29.06 meq/L	>0.05
Pottasium	Male	52	16.9481 meq/L	>0.05
	Female	57	13.28 meq/L	>0.05
Calcium	Male	52	28.28mg/dl	<0.05
	Female	57	31.22 mg/dl	<0.05
Phosphorous	Male	52	29.73 mg/dl	>0.05
	Female	57	25.54 mg/dl	>0.05

**DISSCUSION:**

The weight of breast milk from mothers lactating male baby was significantly more than the weight of breast milk of mothers lactating female baby which indicates that the nutritional needs of male is more than the female and for the same cause ,the specific gravity is higher in the breast milk of mothers lactating male baby .Since the majority of body potassium is contained in muscles and the muscle mass and body weight is more in male , the male baby needs more potassium to build his muscles mass so his milk contain a higher level of potassium <sup>11</sup> .

Most of phosphorus is in bone or is intracellular and the male baby has more body mass than female , so the needs of phosphorus is more in male which possibly lead to the higher concentration of phosphorus in breast milk of mothers lactating male baby <sup>11</sup>. There is a reciprocal relationship between the concentration of phosphorus and calcium in the body fluid which may explain the low concentration of calcium in breast milk of mothers lactating male baby .There were no previous studies concerning the effect of gender of breast fed baby on the quality of breast milk of their mother . Breast milk quality can be used in medico-legal purposes when there is mixing of babies .

**CONCLUSION:**

The gender type of breast fed baby , affect the quality of breast milk of lactating mothers ,because of the nutritional requirement for building the body mass differ according to the gender type. So breast milk of mothers lactating male baby has a higher weight ,specific gravity ,potassium and phosphorus concentration than breast milk of mothers lactating female baby .Breast milk quality can be used in medico-legal .

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