

Status of Mother's Bone Density (0-6 Months) Based on Pattern of Breastfeeding

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Abstract— Breastfeeding protects mothers from osteoporosis. Osteoporosis, the thinning of bone tissue and loss of bone density over time. The women that did not breastfeed has four times greater risk of osteoporosis and often got hip fracture in years after menopause than women who are breastfeeding. After breastfeeding, maternal bone density will be better like previous mother's pregnancy. This study aims to know status of mother's bone density (0-6 months of age) based on pattern of breastfeeding

Observational study with cross-sectional study conducted in Binjai to determine the association between breastfeeding pattern and mother's bone density (0-6 months). Sampling technique uses multistage cluster with sample of 100 mother's breastfeeding. Bone density counting used Bone densitometer. Pattern of breastfeeding were collected by interview using a questionnaire. Data was analyzed using the Mann-Whitney test.

The results showed a pattern of breastfeeding mothers include 87% just only breast milk, 12% of mothers breastmilk and there is 1% predominant breastmilk in partial. Status of bone density lactating are 21% in normal category. Mother's breastfeeding with osteopenia are 64% and there was 15% mother's breastfeeding who are already at the level of osteoporosis. Mann-Whitney Test results show that there are differences in bone density status of the mother with breastfeeding pattern ($p > 0.05$). The pattern of breastfeeding with breast milk was better than mothers who breastfed in partial and predominant for bone density.

Suggested to mother to always breastfeed their babies, and to Binjai City Health Department to continue of promote of breastfeeding in maximal about the benefits of mother's breastfeeding.

Keywords— Breastfeeding patterns, Bone Density, mother's breastfeeding.

I. INTRODUCTION

Somebody's bone density is an indicator for the risk of the osteoporosis occurrence. Osteoporosis is a progressive reduction in bone density, so that bones become brittle and break easily. Bone is composed of minerals such as calcium and phosphate, so that bones become hard and solid. To maintain bone density, the body requires calcium and other adequate mineral

supplies, and should produce sufficient amounts of this hormone (parathyroid hormone, growth hormone, calcitonin, estrogen in women and testosterone in men). Adequate supply of vitamin D, is also needed to absorb calcium from food and incorporate it into bone. Progressively, increasing bone density to achieve maximum density (around age 30). After that the bone density will be reduced gradually. If the body is unable to regulate the mineral content in the bones, the bones will become less dense and more fragile, so osteoporosis. It produces a hormone in sufficient quantity (parathyroid hormone, growth hormone, calcitonin, estrogen in women and testosterone in men). During lactation, calcium absorption in the intestine mother will rise to meet the needs calcium for babies. If the mother's consumption of daily calcium is low, calcium babies need will be met from existing reserves of calcium in the bones of the mother.

Breastmilk is the best food for babies. One of the important components in milk is calcium. Breast milk contains an average of 300 mg of calcium per liter. Therefore, calcium intake should be increased during breastfeeding. Total consumption is recommended during pregnancy and lactation respectively by 1,200 mg per day.

The presumption breastfeeding can reduce bone density so fragile mother that is not true. Our bodies are naturally designed for breastfeeding. Thus, breastfeeding is not going to be a negative influence, both mother and baby. Bone mass after birth will be reduced as much as 3 to 5 percent for calcium is absorbed by the baby. In addition, maternal estrogen production is also reduced in this period. But bone

density will be right again. Mothers who do not breastfeed their children even at risk for osteoporosis at least four times.

Incidence of fractures is currently quite high. Data Hospital Information System (SIRS) at 2010 shows the incidence rate of femur fractures due to osteoporosis are about 200 of 100,000 cases at the age of 40 years [1]. Based on this that this study to know status of mother's bone density (0-6 months) based on pattern of breastfeeding.

II. MATERIALS AND METHODS

This type of research is an observational cross-sectional design. The population in this study is breastfeeding mothers who have babies aged 0-6 months of research conducted in Binjai in five sub-districts South Binjai, Binjai City, East Binjai, North Binjai and West Binjai. The sampling technique in this study conducted by multistage cluster sampling. Cluster is determined by dividing the area is divided into five clusters, there by obtained 100 breastfeeding mothers. The collection of data for patterns of breastfeeding was conducted by interview using a questionnaire. While the data obtained by measuring bone density in the heel (calcaneus) using Bone Densitometer. The data were analyzed descriptively for the data univariate and bivariate data were analyzed with the Mann-Whitney Test.

III. RESULTS AND DISCUSSION

Characteristics of nursing mothers who were respondents are as follows: average age was 25 years with the mother's education is largely SMP many as 35 people (35%) and high school were 58 people (58%). Most of breastfeeding mothers do not work as many as 90 people (90%). Family income largely under minimum wage Binjai city as many as 61 people (61%).

A. Patterns Breastfeeding Mothers

The result is that some mothers to breastfeed their babies only breast milk still provides as much as 87 people (87%). In addition there are 12 people (12%), which in addition to breastfeeding infants were given water, honey and milk formula. There was one person

mothers whose babies are breast-fed only besides also been given solid food. Can clearly be seen in Table 1.

TABEL I
BREASTFEEDING MOTHER DISTRIBUTION BASED BREASTFEEDING PATTERNS

No.	Breastfeeding Patterns	n	%
1	Breast milk still	87	87
2	Predominant Breast milk	12	12
3	Partial Breast milk	1	1
	Total	100	100

B. Breastfeeding Calcium Intake

The results showed that calcium intake of nursing mothers under the supposed adequacy rate for nursing mothers because the mother is very rarely eat animal food is the best source of calcium mother. For wet animal food such as fish, chicken, meat and eggs sebbesar 50% of lactating mothers taking the frequency of 1-3 times a week. While meat consumption is a contributor to the calcium found that most mothers never ate meat (68%). This may be due to family income is categorized under UMK Binjai is <IDR. 1.700.000, -. So that the purchasing power of families against animal food is low. Vegetable food and green vegetables are also good sources of calcium are often consumed by breastfeeding mothers, but in very small amounts that can not meet the capital adequacy of calcium.

In vegetable foods (tofu, tempeh and legumes) often consume most mothers (85%) with the frequency of consumption of more than 3 times a week. For this type of green vegetables by 74% often eat them. Fruits (bananas, oranges and papaya) known to only 50% of women who often eat them. Consumption of mother's milk, from the research found that there is a 21% mothers often consume, 14% rarely and 65% never drink milk. Milk is one of the contributors to the adequacy of calcium as calcium. For a description of maternal calcium intake can clearly be seen in Table 2 below.

TABEL II
BREASTFEEDING DISTRIBUTION BASED CALCIUM INTAKE

No.	Calcium Intake	n	%
1	< 1300 mg	85	85
2	≥ 1300 mg	15	15
	Total	100	100

Research shows that during pregnancy and lactation removed calcium from the bones. The body will replace it back in a long time and the bones will be strong again. Then a breastfeeding mother must meet calcium needs during this period. RDA for calcium during lactation same as during pregnancy, ie 1,200 mg/day [2].

Lack of calcium intake in women may be caused by a lack of knowledge of mothers about the source of calcium and osteoporosis. As research conducted by Setyawati, et al 2015 shows that 90% of women consume less calcium [3]. They also have poor knowledge about osteoporosis and bone density, especially about the source of calcium and as a result of osteoporosis. Statistical analysis showed no significant relationship between knowledge and calcium intake, but women who have a good knowledge about 1.47 times the risk of low calcium consumption.

D. Bone Density Status Breastfeeding Mother

Status bone density breastfeeding mothers are seen from the t-score. The test results showed that the average BQI mother is 56.59. BQI nursing mothers the least is 32 and the highest is 112.20. Based on the results of the examination is also known that the average value of the t-score was -2.12 mother. Value T-score was -3.50 smallest and greatest value is 0.40. Most breastfeeding mothers have osteopenia (64%), which is entering the early stages of osteoporosis. It was also found from the results that there is a nursing mother who is already at a level that is equal to 15% of osteoporosis.

Based Bone Health Check is in accordance with WHO 2003 [4], it is known that for individuals who are elderly, normal values of bone density (T-score) is $-1 \leq SD < 2.5$. Bone density values ≤ -2.5 classified in the category of osteoporosis or have risk of osteoporosis.

The results showed that there were 21 people (21%) of mothers whose status bone density in normal category and as much as 64 people (64%) the status of bone density in the category of osteopenia. Can clearly be seen in Table 3 below

TABEL III
BREASTFEEDING MOTHER DISTRIBUTION BASED BONE DENSITY STATUS

No.	Bone Density Status	n	%
1	Normal	21	21
2	Osteopenia	64	64
3	Osteoporosis	15	15
	Total	100	100

E. Relationship Status Bone Density With Pattern Breastfeeding Mothers

The results of the Mann-Whitney test analysis showed significance is 0.048. Because the value of $p < 0.05$, it can be concluded that there were significant differences in bone density status among mothers who are mothers breast milk alone, predominant breastfeeding (breastfeeding with PASI) and partial breastfeeding (breastfeeding with PASI and MP-ASI). The mothers who are giving only breast milk all have normal bone density. While breastfeeding mothers predominant and partial bone density there are already at the stage of osteopenia and even osteoporosis. Can clearly be seen in Table 4 below.

TABEL IV
DISTRIBUTION OF BONE DENSITY STATUS BY BREASTFEEDING MOTHERS PATTERN AND ANALYSIS RESULTS OF MANN-WHITNEY TEST

Bone Density Status	Breastfeeding Mothers Pattern			N	P value
	Breast milk still (%)	Predominant Breast milk (%)	Partial Breast milk (%)		
Normal	21	0	0	21	0,048
Osteopenia	53	10	1	64	
Osteoporosis	13	2	0	15	
Jumlah	87	12	1	100	

This shows that breastfed babies do not lead to reduced bone density during maternal calcium intake are met in accordance with the needs. Calcium needs increase during breast-feeding mothers. Reduced bone density in breastfeeding mothers only temporary.

This is confirmed by research conducted by Chan, et.al 2016, found that there is an increased need for

calcium during breastfeeding are influenced by the mobilization of bone and renal calcium conservation in the early postpartum period [5]. Bone mineral loss during lactation is temporary and breastfeeding mothers showed variable skeletal response to breastfeed. So breastfeeding mothers should eat more calcium than mothers who formula feed their babies. But bone mineral loss during lactation is temporary.

Breastfeeding protects the mothers from osteoporosis. The women that did not given breastfeeding has a four times greater risk of osteoporosis and often got hip fracture in years after menopause than women who are breastfeeding. After breastfeeding, maternal bone density will be better like before mother's pregnancy. If the mother can meet adequate calcium intake during lactation, the mother will not experience a decrease in bone density. Because one of the risk factors of osteoporosis in women is an adequate calcium.

IV. CONCLUSION

There are differences in bone density based on the pattern of breastfeeding mothers breastfeeding mothers. Most breastfeeding mothers already have osteopenia (64%), which is entering the early stages of osteoporosis and there (15%) were already at the level of osteoporosis.

Suggested to Binjai City Health Department to maximize outreach activities to nursing mothers in terms of consumer intake of good sources to fulfill their calcium starts from the concept to the pregnancy.

ACKNOWLEDGEMENT

This research owes its existence to the help and support of Reasearch Institutions University of North Sumatera by facilitating the interview to the workers

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Dewasa Muda. Jurnal Kesehatan Reproduksi Vol. 5 No. 2 Tahun 2014

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