
ANALYSIS OF EFFECT THE CAFFEINE AND CARBONATION INTAKE TO BONE DENSITY OF PREGNANT WOMEN

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Abstract

Decreased bone density is a serious health problem because its prevalence continues to increase throughout the world, especially for women. Intake of caffeinated and carbonated drinks is one factor that can affect bone density. This study aims to analyze the effect of caffeine and carbonation intake on bone density in pregnant women. This cross-sectional research was conducted in the Andalas Padang Community Health Center working area on 73 pregnant women in the third trimester using a purposive sampling technique. Structured interviews were conducted using a semi-quantitative food frequency questionnaire (nutritional intake). Data were analyzed using One Way Anova, Kruskal-Wallis and multiple linear regression tests. The results of statistical tests show that there is no significant relationship ($p>0.05$) between consumption of caffeinated and carbonated drinks and bone density in pregnant women. However, to find out the extent of the effect, a tertile test was carried out. The results showed that consumption of caffeinated drinks had an impact on the bone density of pregnant women because the less caffeine the mother consumed, the better the mother's bone density, although statistically it was not significant, and for carbonated drinks based on the tertile test, the results were the same between tertile 1 to tertile 3, namely the median 0.00 mg/1000 kcal/day so there are no significant results between carbonation intake and bone density. The conclusion of this study is that caffeine intake plays an important role in bone density in pregnant women.

Key words: Pregnant women, bone density, caffeine, carbonation

INTRODUCTION

Decreased bone density is a serious health problem because its prevalence continues to increase throughout the world, especially for women. Bone density varies with age, increasing in the first part of life and decreasing gradually in adulthood. There is evidence that factors such as a lack of a healthy lifestyle (the habit of consuming excessive coffee and soda) have a detrimental effect on bone mineral mass (Sherwood L, 2011). Normal metabolism of bones also depends on calcium. Low calcium levels in tissue can interfere with the bone's ability to respond optimally (Daroszewska, 2015). During pregnancy and breastfeeding, some of the mother's bone calcium will be absorbed for her baby's needs (Zahoor, 2010). Considering the importance of maintaining bone density during pregnancy and because there are still very few measurements of bone density in pregnant women and no one has conducted comprehensive research on caffeine and carbonation intake on bone density in pregnant women, the author is interested in analyzing caffeine and carbonation intake on bone density in pregnant women. This study aims to analyze the effect of caffeine and carbonation intake on bone density in third trimester pregnant women.

RESEARCH METHODS

This cross-sectional research was conducted in the Andalas Padang Community Health Center working area on 73 pregnant women in the third trimester using a purposive sampling technique who met the inclusion criteria. Bone Density Measurement Method Bone Densitometry Quantitative Ultrasound (QUS) Method. Structured interviews were conducted using a semi-quantitative food frequency questionnaire (nutritional intake). Data were analyzed using the One Way Anova, Kruskal-Wallis test.

RESEARCH RESULT

The results of statistical tests show that there is no significant relationship ($p>0.05$) between consumption of caffeinated and carbonated drinks and bone density in pregnant women, however, if we look at the tertile test, it is found that caffeinated drinks have a significant relationship with bone density in pregnant women.

Table 1. Analysis of the effect of caffeine and carbonation intake on bone density in pregnant women (n=73)

Independent Variable	Bone Density						p value*	
	Tertile 1		Tertile 2		Tertile 3			
	Median	IQR	Median	IQR	Median	IQR		
Carbonated drinks (mg/1000 kcal/day)	0.00	0.00	0.00	0.00	0.00	0.00	0.383	
Caffeinated drinks (mg/1000 kcal/day)	51.84	35.34	51.72	26.57	50.77	37.83	0.992	

* Kruskal-Wallis test

DISCUSSION

The results of the study showed that there was no relationship between carbonated drink consumption and bone density in pregnant women with a value of $p=0.383$ ($p>0.05$) and the median tertile 1-3 with the same value of carbonated drink consumption, namely 0.00 mg/1000 kcal /day. It can be seen beforehand that some of the respondents in this study did not consume carbonated drinks during pregnancy. In this study, the majority of pregnant women did not consume carbonated drinks during pregnancy and because the average volume of carbonated drinks that some respondents consumed was very small ($< 150\text{mg/day}$) so the intake of phosphorus from carbonated drinks was relatively low, therefore it did not affect bone density. Mother. The results of research on the intake of caffeinated drinks show that there is no significant relationship between caffeine consumption and bone density in pregnant women with a value of $p = 0.992$. However, looking at the tertile range, there is an effect of caffeine on bone density, where the lower the mother's caffeine intake, the more the mother's bone density will increase. This is because the caffeine contained in coffee can inhibit calcium absorption.

Inhibited calcium absorption can interfere with the bone remodeling process. In this study, bone density disorders can be caused by various factors so that even though respondents consume <150 mg caffeine/day, there is still a possibility of osteoporosis due to other factors. Pregnant women who consume caffeine < 150 mg/day are likely to have parity ≥ 3 times the risk of developing bone density disorders.

CONCLUSION

The conclusion of this study is that caffeine intake plays an important role in influencing bone density in pregnant women.

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