

# The relationship between anthropometric measurements and breast milk ghrelin and nesfatin-1 levels in infants with small for gestational age



<sup>1</sup>Berna Eroğlu Filibeli, <sup>2</sup>Melike Karabulut, <sup>3</sup>Saliha Aksun, <sup>4</sup>Gönül Çatlı, <sup>4</sup>Bumin Dünder

<sup>1</sup>Tepecik Training and Research Hospital, Department of Pediatric Endocrinology, Izmir, Turkey

<sup>2</sup>Tepecik Training and Research Hospital, Department of Pediatrics, Izmir, Turkey

<sup>3</sup>Katip Celebi Üniversitesi, Departments of Medical Biochemistry, Izmir, Turkey

<sup>4</sup>Katip Celebi University, Department of Pediatric Endocrinology, Izmir, Turkey



## Introduction

Hormones such as leptin, adiponectin, ghrelin and nesfatin-1 have been shown in breast milk in various studies and it has been suggested that these hormones may affect growth of breastfed infants.

## Methods

A total of 20 infants with small for gestational age (SGA) and 20 control infants with appropriate for gestational age (AGA) were involved in the study. Anthropometric measurements of infants have been performed at the birth-1st-4th months including head circumference (HC), chest circumference (CC), mid-upper arm circumference (MAC) and triceps skin fold thickness (TSF). TGh and nesfatin-1 levels in the 1st and 4th months in the breast milk were studied with ELIZA method.

Table 1. Anthropometric measurements of SGA and AGA infants at birth

	Average ± standard error		
	SGA (n=20)	AGA (n=20)	p
Weight (gr)	2345 ± 39,7	3361 ± 50,3	< 0,001
BMI (kg/m <sup>2</sup> )	10,6 ± 0,17	13,1 ± 0,21	< 0,001
HC (cm)	33 ± 0,29	34 ± 0,2	< 0,001
CC (cm)	28,9 ± 0,33	32,6 ± 1,3	< 0,001
TSF (cm)	5,1 ± 0,16	6,4 ± 0,73	< 0,001
MAC (cm)	8,3 ± 0,17	9,9 ± 0,61	< 0,001

Table 2. Comparison of TGh and nesfatin-1 levels in both SGA and AGA infants in the first and fourth month

	Average ± standard error		
	SGA (n=20)	AGA (n=20)	p
1 st TGh (pg/mL)	624,05 ± 53,7	536,90 ± 27,2	> 0,05*
4 th TGh (pg/mL)	521,80 ± 45,7	596,45 ± 26,9	<b>0,015*</b>
p	> 0,05**	> 0,05**	
1 st nesfatin-1 (pg/mL)	447,4 ± 86,5	375 ± 35,4	> 0,05*
4 th nesfatin-1 (pg/mL)	305,2 ± 30,3	267 ± 122,2	<b>0,034*</b>
p	<b>0,006**</b>	<b>&lt; 0,001**</b>	

## Objective

It was aimed to evaluate the relationship between total ghrelin (TGh) and nesfatin-1 levels in breast milk with anthropometric measurements in the first 4 months of life in infants with small for gestational age (SGA) showing fast growth pattern.

## Results

- The anthropometric measurements of SGA group in birth and 1st month were determined significantly lower than AGA group (p<0,05) (Table 1).
- However, in the 4th month, that variation was not significant except the body weight (p>0,05).
- In the 4th month, TGh and nesfatin-1 values in breast milk in SGA infants were significantly lower compared to AGA infants (p<0,05) (Table 2).
- TGh levels in the 4th month were significantly lower in SGA group than control group (p<0,05).
- The 1st month breast milk nesfatin-1 levels were found significantly lower than the 4th month breast milk nesfatin-1 levels for both groups. However, there was a significantly difference only for 4th month breast milk nesfatin-1 levels between the groups. (p<0,05).
- There was a negative correlation between 1st month nesfatin-1 levels and weight, HC and CC at birth and 1st month HC (Table 3).
- There was a negative correlation between 4 th month nesfatin-1 levels and weight and CC at birth, and 4 th month HC and CC in SGA group (Table 3).
- No correlation has been detected between anthropometric measurements of SGA and AGA infants in birth and 1st and 4th month and breast milk TGh (p>0,05).

Table 3. Correlation between SGA infants' anthropometric measurements and nesfatin-1 levels in breast milk

	At birth		1 st month		4 th month							
	1 st Nesfatin-1	4 th Nesfatin-1	1 st Nesfatin-1	4 th Nesfatin-1	1 st Nesfatin-1	4 th Nesfatin-1						
	r	p	r	p	r	p						
Weight (gr)	-0,662	<b>0,001</b>	-0,508	<b>0,022</b>	-0,436	>0,05	-0,424	>0,05	-0,404	>0,05	-0,330	>0,05
BMI (kg/m <sup>2</sup> )	-0,368	>0,05	-0,252	>0,05	-0,043	>0,05	-0,148	>0,05	-0,054	>0,05	0,115	>0,05
HC (cm)	-0,613	<b>0,004</b>	-0,438	>0,05	-0,568	<b>0,009</b>	-0,512	<b>0,021</b>	-0,261	>0,05	-0,265	>0,05
CC(cm)	-0,668	<b>0,001</b>	-0,517	<b>0,02</b>	-0,428	>0,05	-0,467	<b>0,038</b>	-0,096	>0,05	0,003	>0,05
TSF (cm)	-0,387	>0,05	-0,367	>0,05	-0,210	>0,05	-0,058	>0,05	-0,346	>0,05	-0,263	>0,05
MAC (cm)	-0,541	>0,05	-0,295	>0,05	-0,425	>0,05	-0,29	>0,05	-0,301	>0,05	-0,144	>0,05

## Conclusion

TGh and nesfatin-1 levels in breast milk were established to show differences in SGA infants compared to AGA infants. In SGA group; determining of low breast milk TGh levels in the 4th month indicates that active Gh can be more effective in growth of these infants. On the other hand, decline in nesfatin-1 levels in the 4th month and negative correlation between nesfatin-1 and anthropometric measurements show that nesfatin-1 can be a protective factor from obesity in these babies.

