

# SEASONAL DIFFERENCES IN PLASMA 25-OH VITAMIN D CONCENTRATIONS IN CORD BLOOD

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## BACKGROUND

25-OH vitamin D levels in newborns depend directly on their mother's status. In a previous study, 25-OH vitamin D levels were determined in cord blood in a cohort of women after winter months, showing deficient values in 94% of population (mean 25-OH vitamin D value  $10.4 \pm 6.1$  ng/ml). Correlation between low 25-OH vitamin D levels and low sun exposure, dark skin phototype and Indo-Pakistani ethnicity were observed.

The aim of this new study is to describe vitamin D status in pregnant women after summer months by determination in umbilical cord blood and to determine if there are differences with previous results.

## SUBJECTS AND METHODS

Between October and early December 2014, 103 pregnant women were recruited at the Hospital del Mar (Barcelona), in whom plasma 25(OH)D (LIAISON® 25 OH Vitamin D Total Assay) was measured in cord blood at birth by chemiluminescence. Clinical history data were collected and a nutritional survey (Garabédian survey) was made on maternal vitamin D and calcium intake and sun exposure.

## RESULTS

The main results are shown in Table 1.

- There were differences between vitamin D intake and sun exposure in the two periods ( $p < 0.001$ ) (Figure 1-3).
- Mean 25(OH)D level in cord blood was  $12.4 \pm 7.2$  ng/ml ( $< 4 - 33.6$  ng/ml). No statistically significant differences were observed between 25(OH)D levels after winter and summer months ( $p = 0.108$ ) (Figure 4).
- Low vitamin D levels in cord blood were significantly related to ethnicity (Indo-Pakistani and Maghreb) (Figure 5), dark skin phototype, the covered dressing style and low sun exposure ( $p < 0.001$ ).

Table 1. Mean and standard deviation of vitamin D intake, calcium intake, sun exposure and 25(OH)D levels in cord blood

Patients	(number of pregnant women)	Vitamin D intake (IU/day)	Calcium intake (mg/day)*	Sun exposure index*	25(OH)D (ng/ml)*
Total	Summer (103)	129.9±70.8	811.2±472.7	6.35±2.5	12.4±7.2
	Winter (99)	201.1±94.6	783.2±328.6	4.2±2.7	10.4±6.1
		$p < 0.001$	$p 0.799$	$p < 0.001$	$p 0.108$
Caucasian	Summer (38)	148.3±69.8	758.6±360.7	8.5±1.6	17.9±5.8
	Winter (44)	220.6±95.7	908.8±322.31	5.4±2.6	13.2±6.5
Indo-Pakistani	Summer (36)	104.17±72.9	638.3±310.85	4±1.1	6.7±4.2
	Winter (24)	181.5±105.4	568.6±301.9	1.9±1.5	7.2±5.9
South American	Summer (16)	142.4±62.8	1181.7±796	6.88±2	13.4±5.5
	Winter (20)	200.5±91.5	765±260.7	4.5±2.5	9.1±3.7
Maghreb	Summer (8)	136.6±67.2	941.8±185.8	5±2.6	8.4±6
	Winter (3)	147.6±21.8	860±466.5	2±1	6.9±1.4
Gipsy	Summer (5)	125.7±60.7	1061.1±506.2	7.20±1.9	14.1±6.9
	Winter (6)	169±58.1	687.1±189.2	4±2.8	8.7±2.4

\* statistically significant parameters, comparison by ethnicity ( $p < 0.05$ )

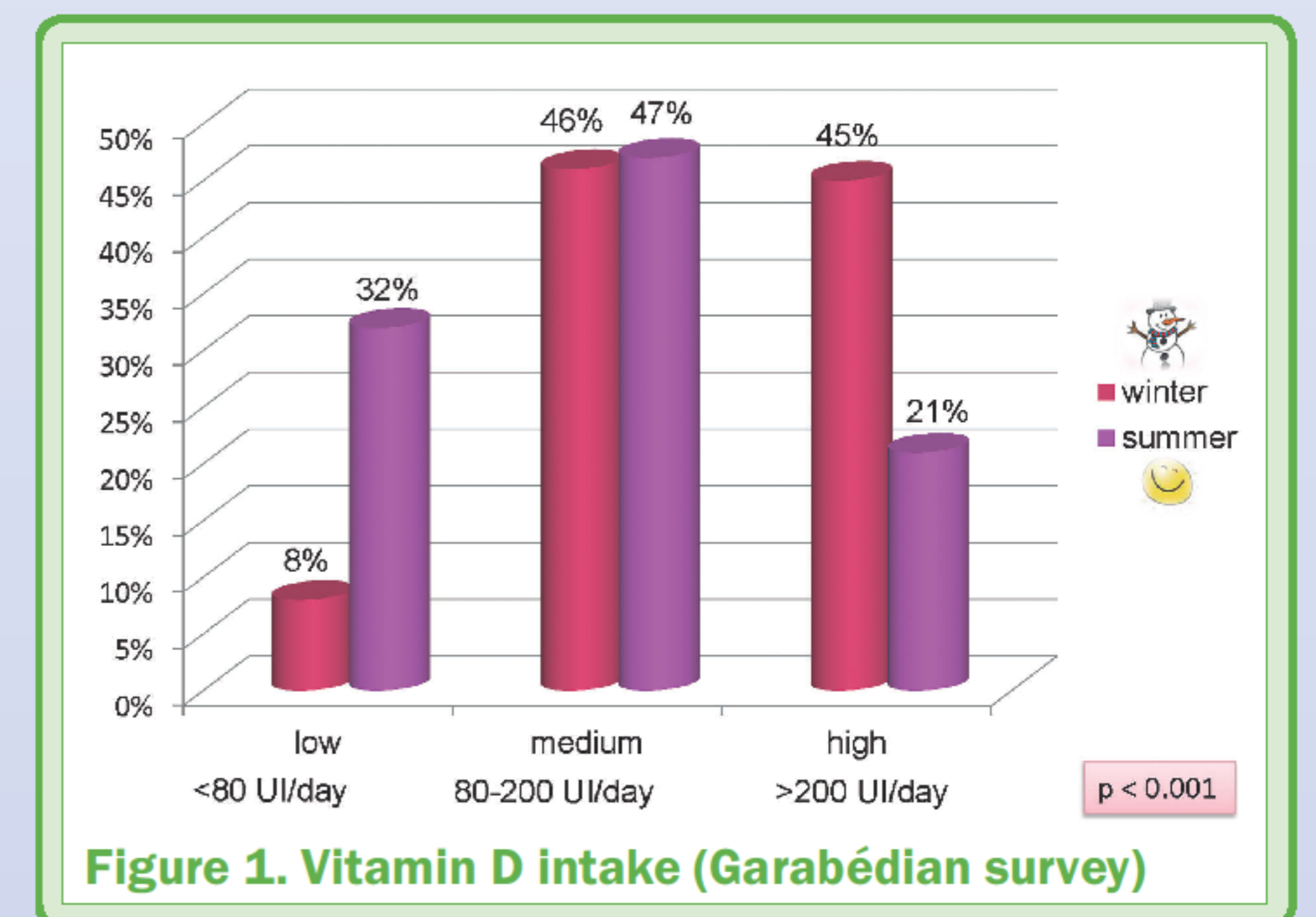


Figure 1. Vitamin D intake (Garabédian survey)

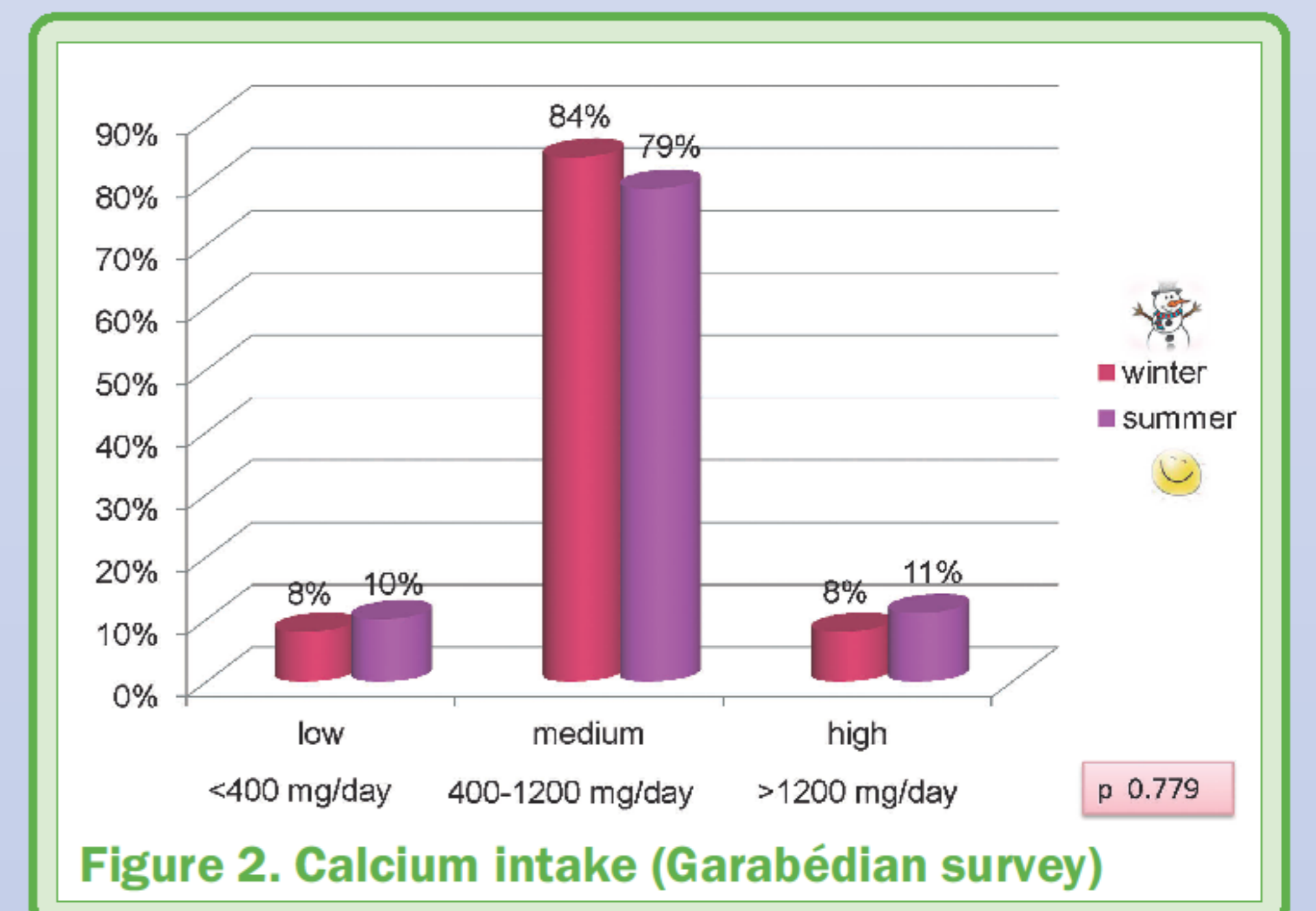


Figure 2. Calcium intake (Garabédian survey)

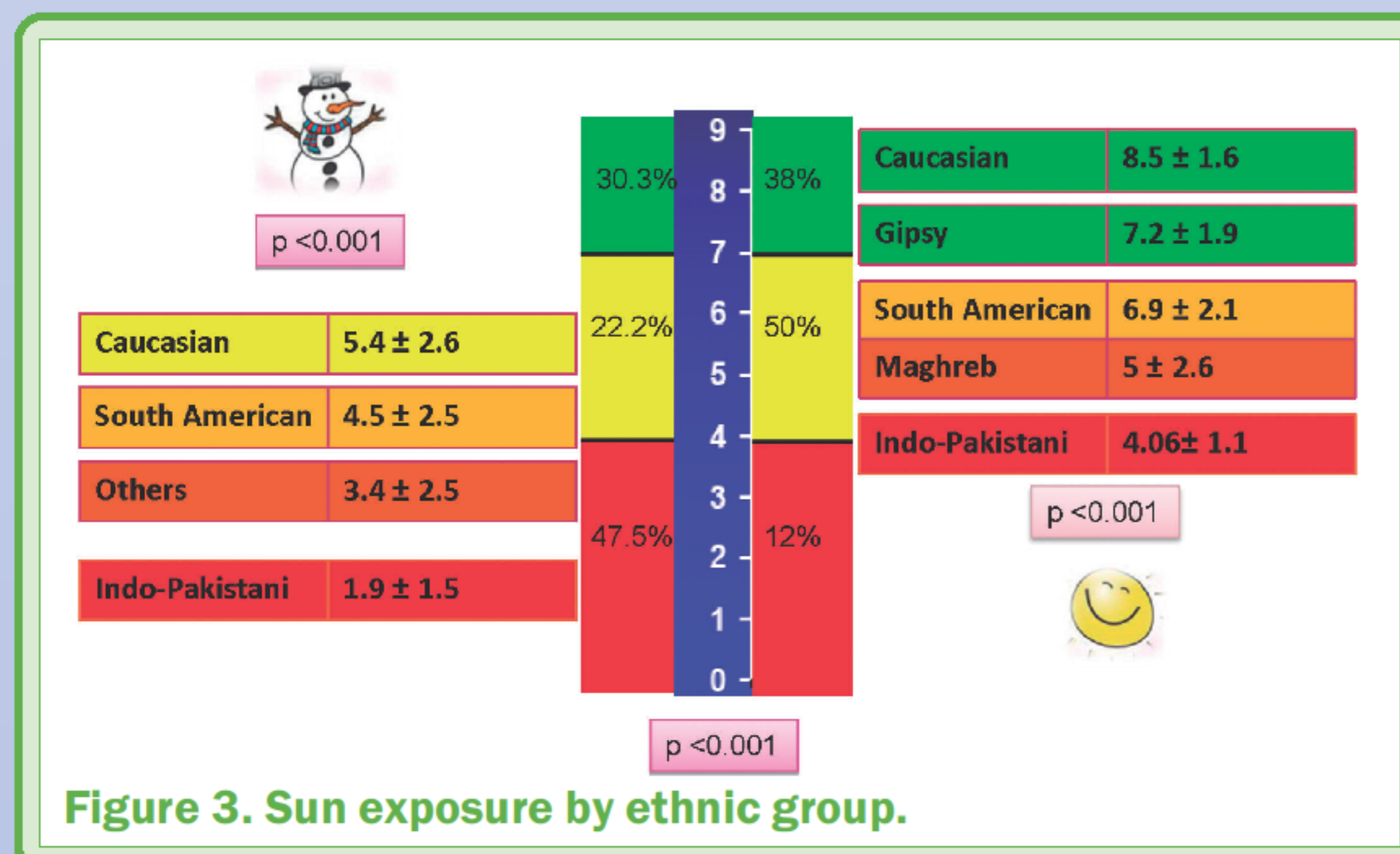


Figure 3. Sun exposure by ethnic group.

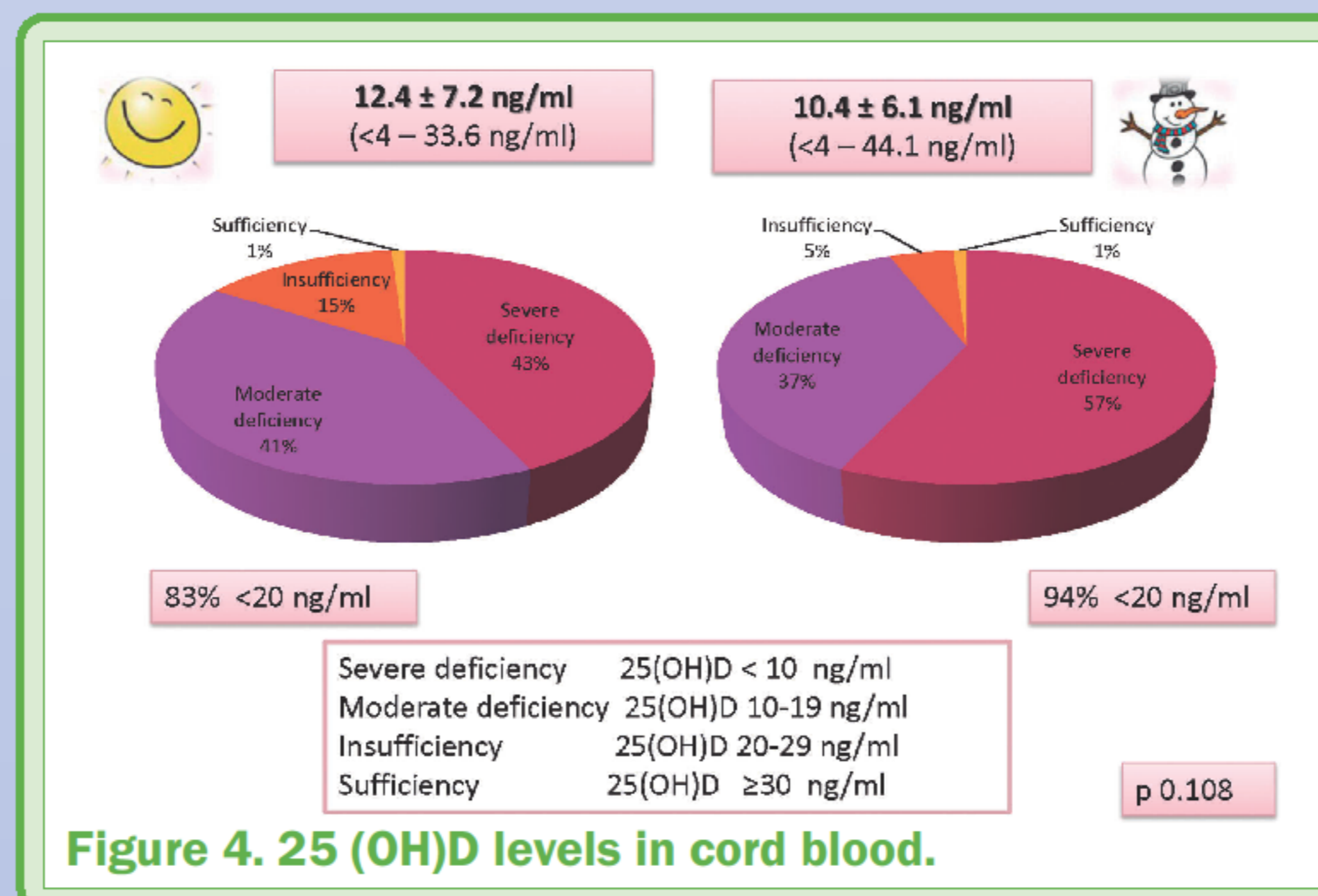


Figure 4. 25(OH)D levels in cord blood.

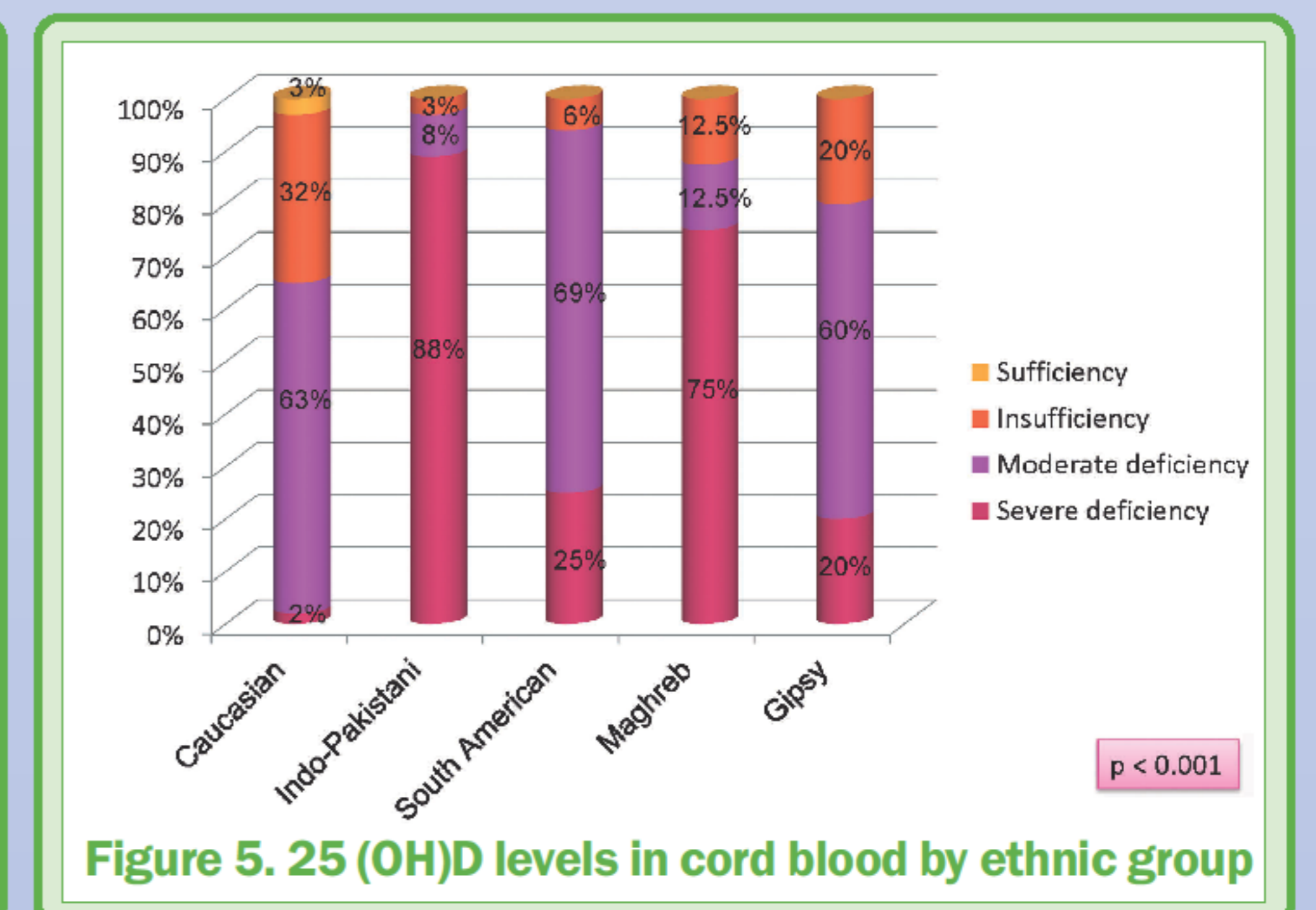


Figure 5. 25(OH)D levels in cord blood by ethnic group

## CONCLUSIONS

- There is a high prevalence of vitamin D deficiency in pregnant women at the end of gestation regardless of the season and increased sun exposure in our region.
- Much more effective vitamin D preventive and therapeutic intervention should be implemented in this population, especially in certain risk groups (Indo-pakistani ethnicity and dark skin).

