

Reference values of TSH, free T4 and free T3 in a cohort of pregnant women in the north of Spain

Ruiz Ochoa D^a; Piedra León M^e; Baamonde Calzada C^b; Mateos García F^b; Setién Rodríguez A^c; Temprano Marañón C^c; Zubeldia Valdés R^c; Gutierrez Chicote L^c; Mouriz Monleon A^c; Álvarez Del Campo M^c; Secadas López RN^d; Otero García A^c; Tejado Elviro I^a; Amado Señaris JA^e.

a Endocrinology and nutrition. Sierrallana Hospital. Torrelavega. Cantabria. Spain. b Clinical analysis. Sierrallana Hospital. Torrelavega. Cantabria. Spain. c Midwife. Primary care. Cantabria. Spain. d Midwife. Sierrallana Hospital. Torrelavega. Cantabria. Spain. e Endocrinology and nutrition. Marqués de Valdecilla University Hospital. Santander. Cantabria. Spain.

INTRODUCTION: As soon as pregnancy is established, various physiological changes occur in maternal thyroid economy. Due to that, the reference limits of thyroid parameters used for the general population are no longer valid to diagnosis thyroid dysfunction during pregnancy.

METHODS: We included 266 pregnant women, with no thyroid disorders and resident in Cantabria, a region in northern Spain. They were questioned about iodized salt and iodine supplements intake and blood samples for TSH, free T4 and free T3 were obtained in the first, second and third trimester of gestation and for TPO abs and Tg abs in the first trimester.

RESULTS: The median age was 32 years (IQR 7). Anti-TPO or anti-Tg were elevated in 18 (6,74%) women that were excluded from the study.

Fig 1. Consumption of iodized salt and iodine supplement in first (A) and third (B) trimester.

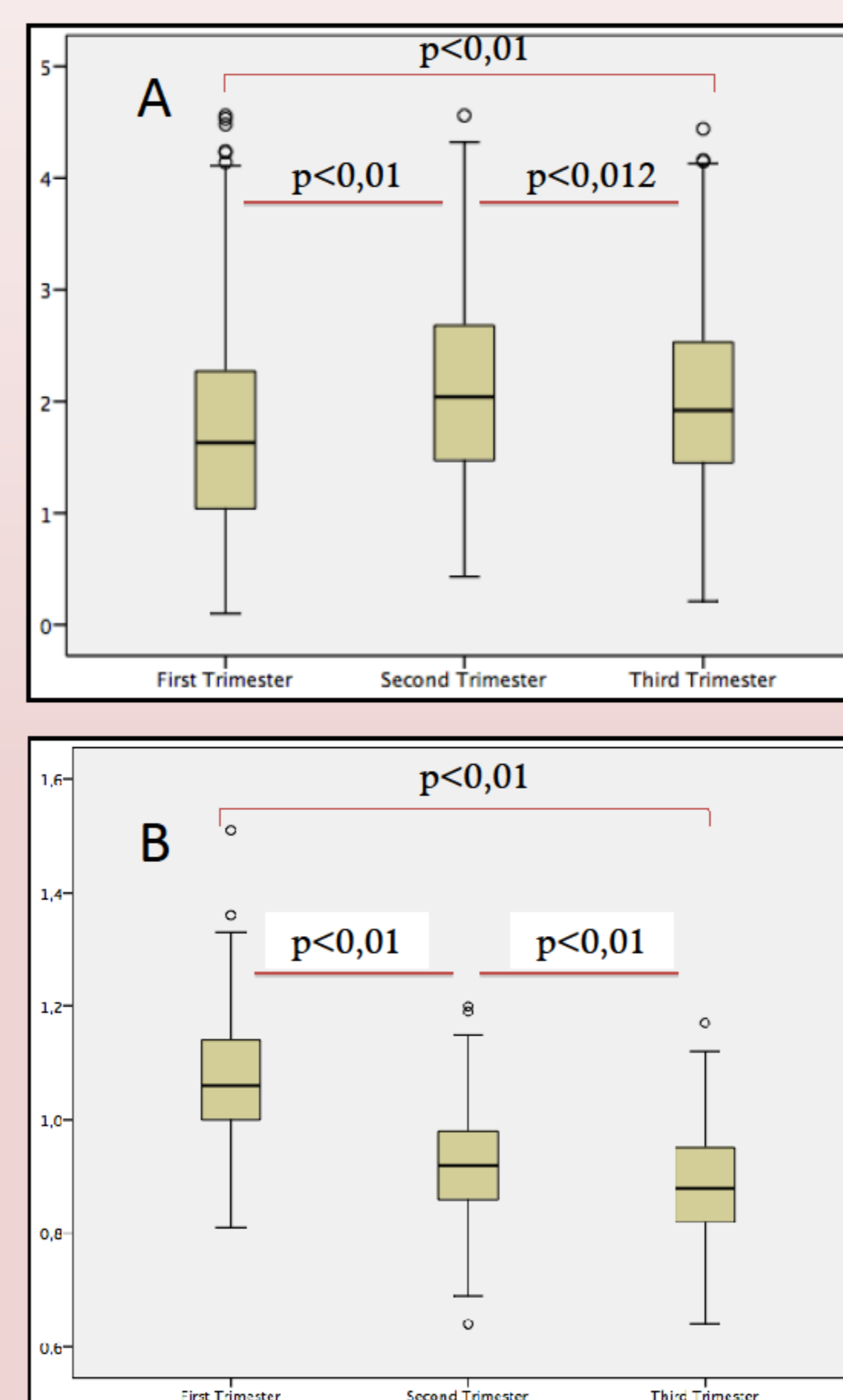
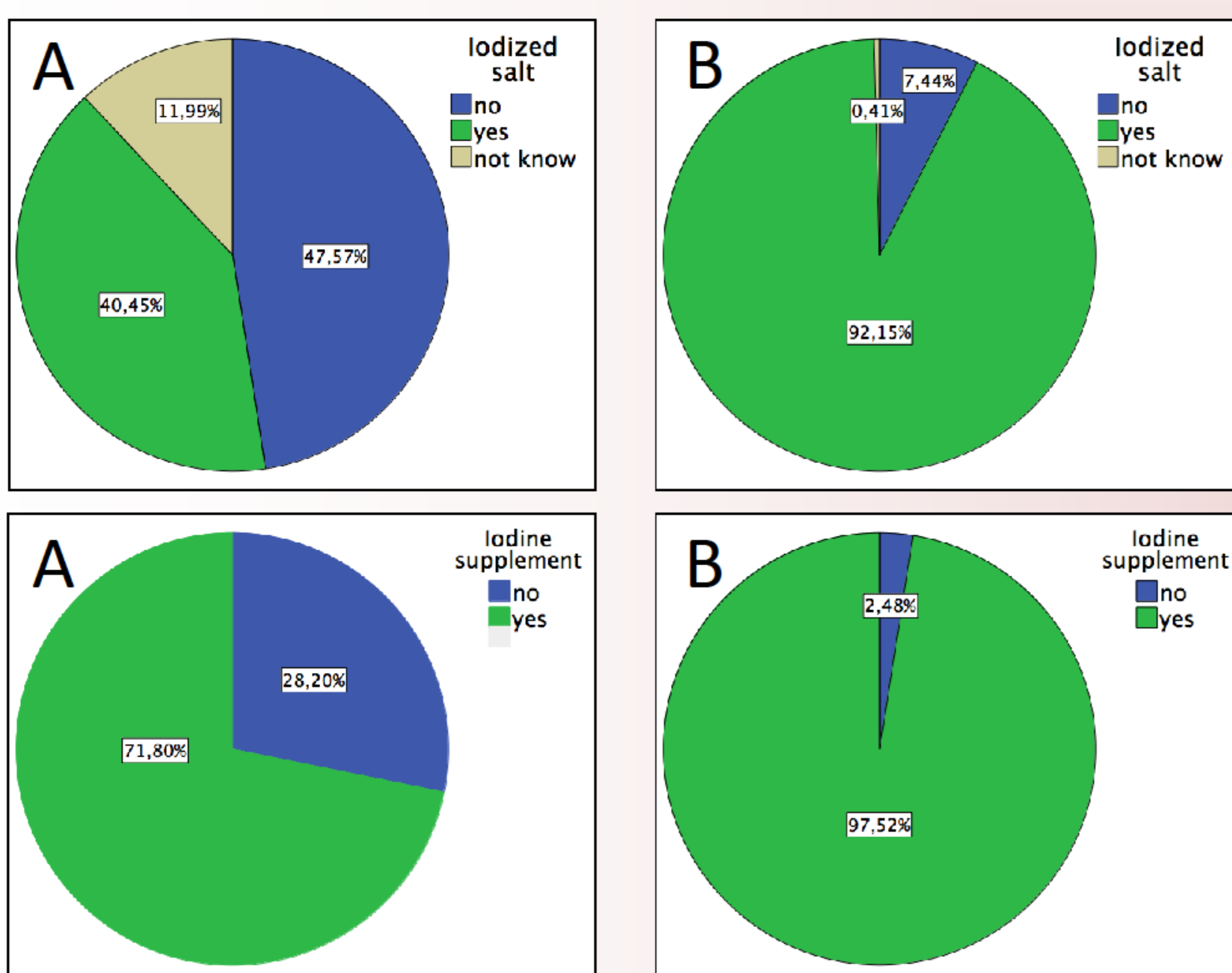


Fig 2. Trends of TSH (A), FT4 (B) and FT3 (C) during each trimester of pregnancy in TPOab or Tgab negative women

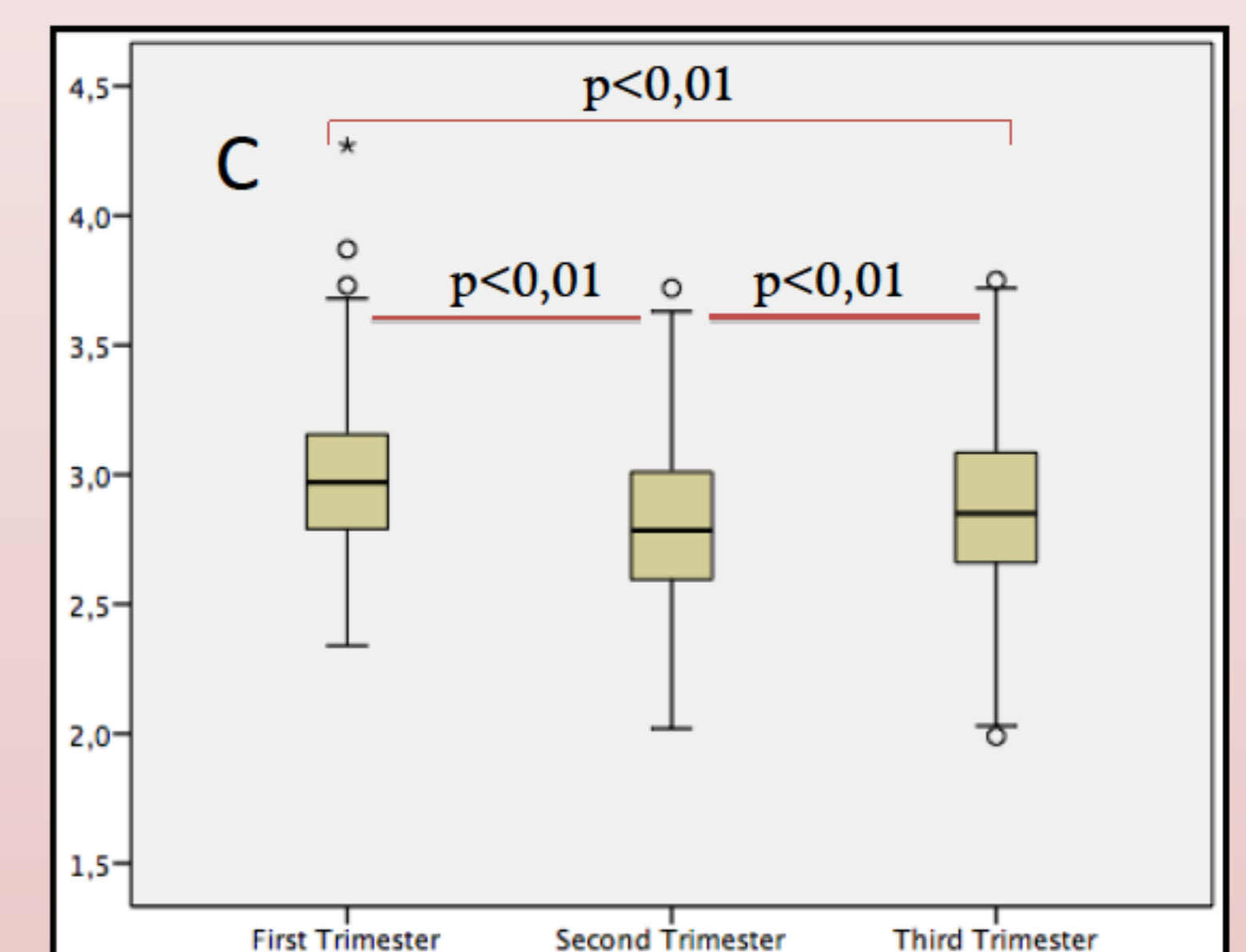


Table 1. Reference values of TSH, FT4 and FT3 expressed as median and P2.5-P97.5

	FIRST TRIMESTER			SECOND TRIMESTER			THIRD TRIMESTER		
	Mean (SD)	Median (IQR)	P2,5-97,5	Mean (SD)	Median (IQR)	P2,5-97,5	Mean (SD)	Median (IQR)	P2,5-97,5
TSH	1.749 (0.959)	1.630 (1.240)	0.272-4.132	2.128 (0.841)	2.04 (1.225)	0.795-3.857	2.02 (0.802)	1.92 (1.090)	0.657-3.950
FT4	1.07 (0.109)	1.06 (0.28)	0.86-1.31	0.92 (0.09)	0.92 (0.12)	0.74-1.11	0.89 (0.09)	0.88 (0.13)	0.70-1.07
FT3	2.98 (0.29)	2.97 (0.36)	2.42-3.64	2.80 (0.30)	2.78 (0.42)	2.24-3.45	2.87 (0.31)	2.85 (0.42)	2.27-3.53

Table 2. Potential for misclassification of thyroid function tests in pregnant women if international reference intervals for TSH and non-pregnant reference intervals for FT4 and FT3 are used.

	n	Results potentially misclassified, n(%)		
		FIRST TRIMESTER	SECOND TRIMESTER	THIRD TRIMESTER
TSH	248	44(17.6)	41(16.4)	33(13.2)
FT4	248	14(5.6)	11(4.4)	8(3.2)
FT3	248	9(3.6)	12(4.8)	10(4.0)

CONCLUSIONS:

Method-and gestation-specific reference ranges are needed to avoid misdiagnosis of thyroid function during pregnancy. All thyroid function parameters (TSH, FT4 and FT3) differ significantly between each trimester of pregnancy. The lowest level of TSH is identified in the first trimester to rise to its highest level in the second. Free T4 levels consistently decrease reaching the lowest levels in the third trimester.

- BIBLIOGRAPHY:**
- Management of thyroid dysfunction during pregnancy and postpartum: an Endocrine Society clinical practice guidelines, J.Clin. Endocrinol. Metab.92 (8 Suppl.) (2007) s1-s47.
 - Thyroid Physiology in Pregnancy. Endocrine Practice.20(6) (2014) 589-596.
 - WHO/ICCIDD/UNICEF. Assessment of iodine deficiency disorders and monitoring their elimination: a guide for programme managers. Geneva: World Health Organization, 2007. http://whqlibdoc.who.int/publications/2007/9789241595827_eng.pdf