Tiroide e fertilità al maschile e al femminile

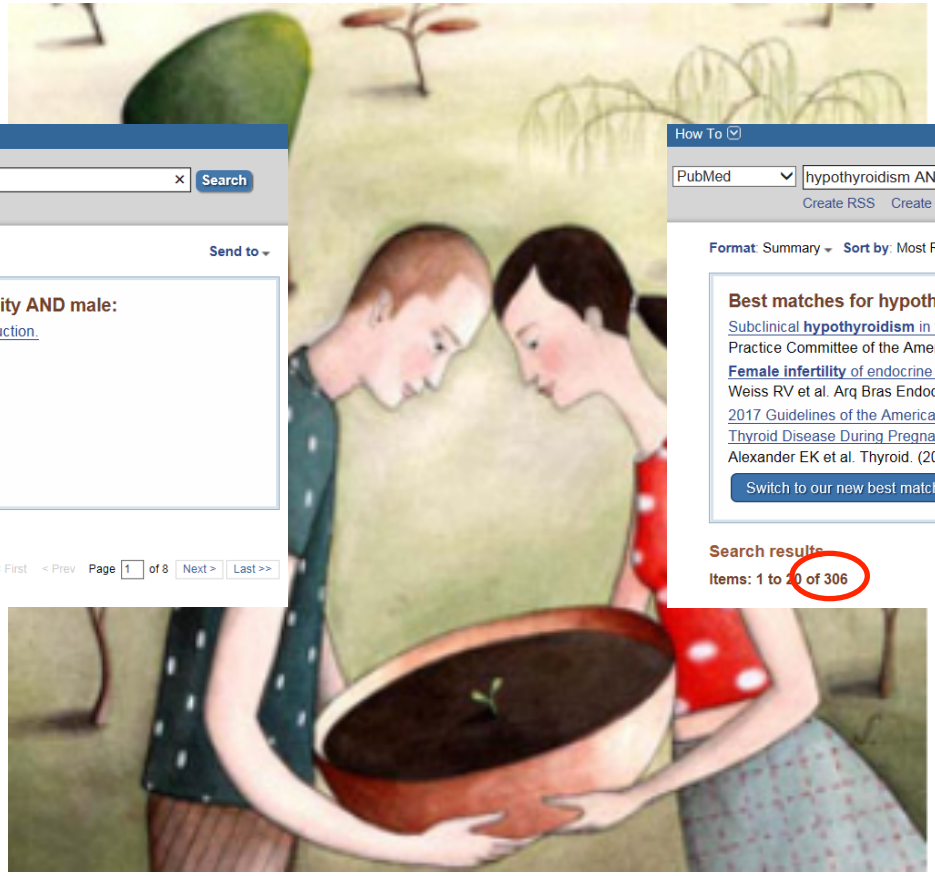
Ipotiroidismo e fertilità

C. Cappelli, Brescia

Roma, 8-11 novembre 2018

Ipotiroidismo e fertilità

ITALIAN CHAPTER



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Aiceles V et al. Horm Mol Biol Clin Investig. (2016)

Gender and Sexual Health: **Infertility**.
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Thyroid Dysfunction and **Male** Reproductive Physiology.
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Subclinical **hypothyroidism** in the infertile **female** population: a guideline.
Practice Committee of the American Society for Reproductive Medicine. et al. Fertil Steril. (2015)

Female infertility of endocrine origin.
Weiss RV et al. Arq Bras Endocrinol Metabol. (2014)

2017 Guidelines of the American Thyroid Association for the Diagnosis and Management of Thyroid Disease During Pregnancy and the Postpartum.
Alexander EK et al. Thyroid. (2017)

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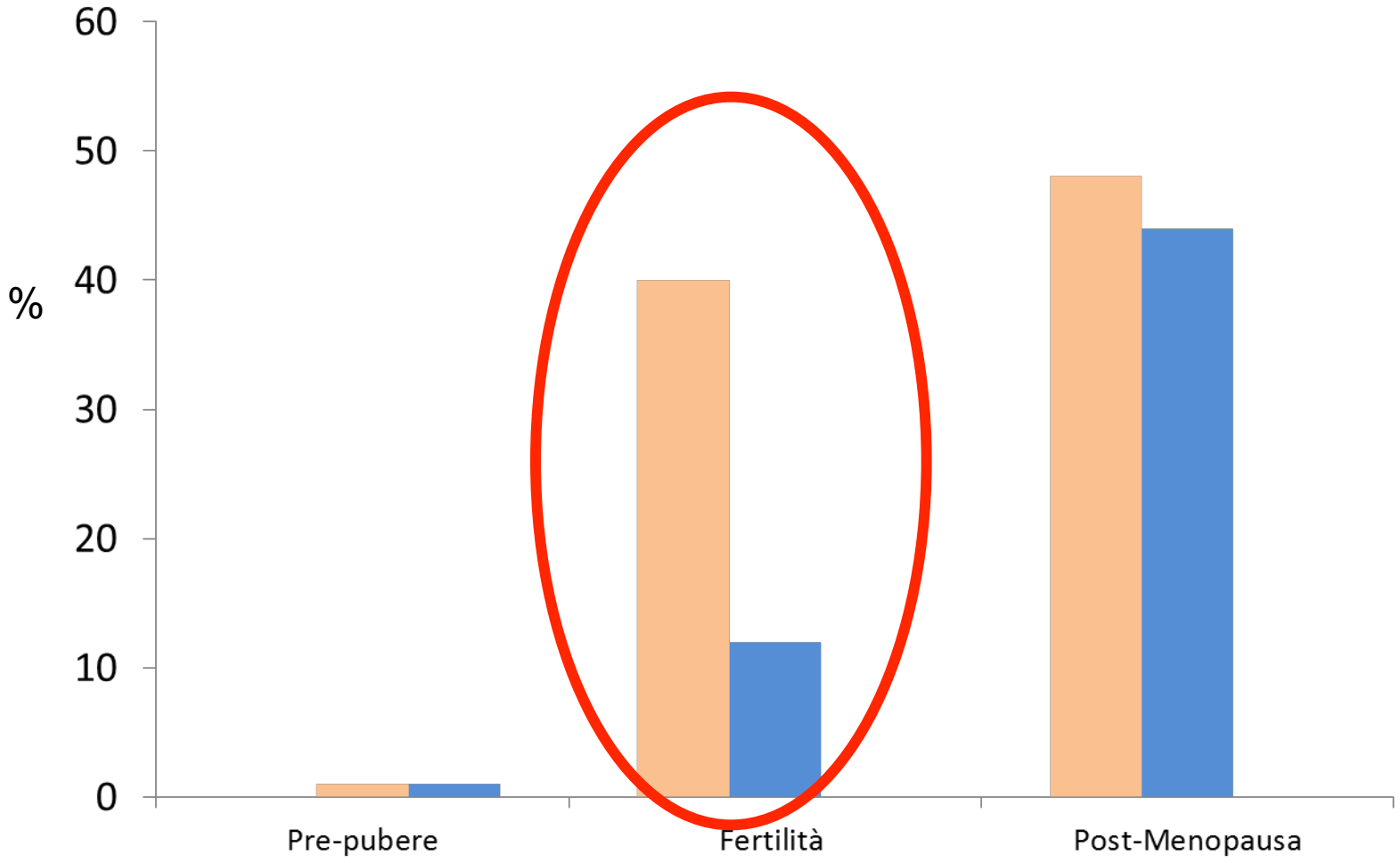

Endocrine, 2017

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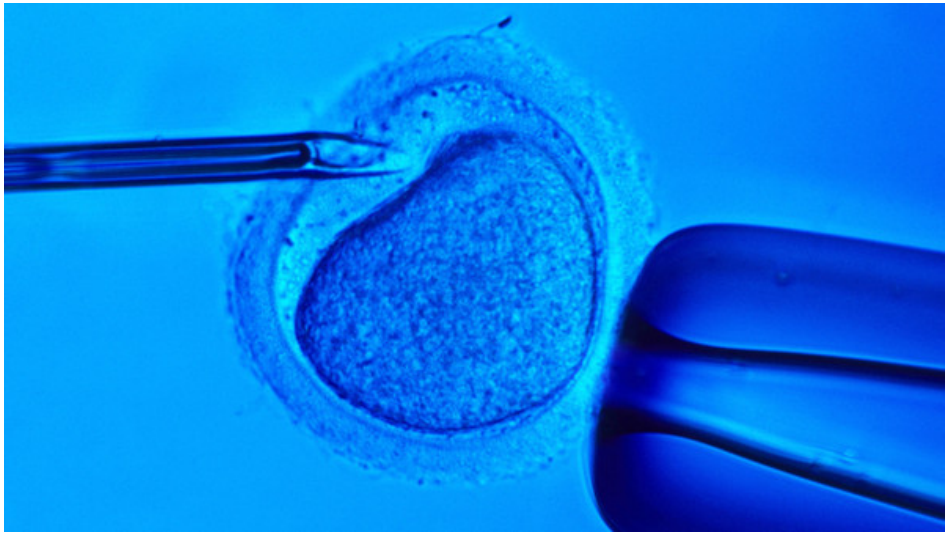


Roma, 8-11 novembre 2018

Ipotiroidismo e fertilità

ITALIAN CHAPTER

REVIEW

Thyroid Function and Human Reproductive Health

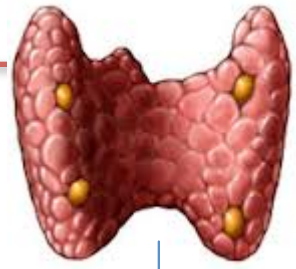
G. E. Krassas, K. Poppe, and D. Glinoer

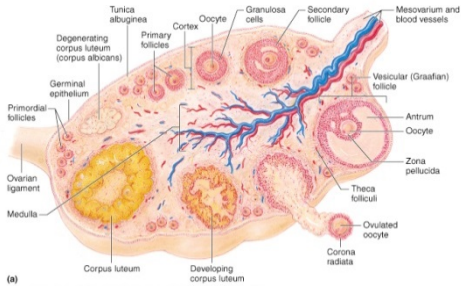
Department of Endocrinology, Diabetes, and Metabolism (G.E.K.), Panagia General Hospital, 55132 Thessaloniki, Greece; Department of Endocrinology (K.P.), University Hospital Brugmann, 1020 Brussels, Belgium; and Division of Endocrinology (D.G.), Department of Internal Medicine, University Hospital Saint-Pierre, 1000 Brussels, Belgium

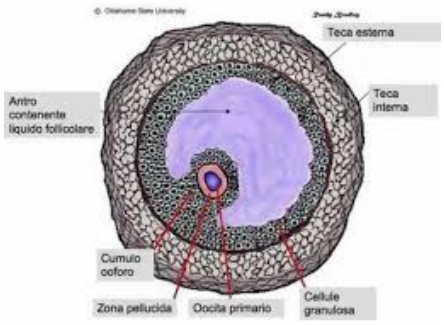
Via its interaction in several pathways, normal thyroid function is important to maintain normal reproduction. In both genders, changes in SHBG and sex steroids are a consistent feature associated with hyper- and hypothyroidism and were already reported many years ago. Male reproduction is adversely affected by both thyrotoxicosis and hypothyroidism. Erectile abnormalities have been reported. Thyrotoxicosis induces abnormalities in sperm motility, whereas hypothyroidism is associated with abnormalities in sperm morphology; the latter normalize when euthyroidism is reached. In females, thyrotoxicosis and hypothyroidism can cause menstrual disturbances. Thyrotoxicosis is associated mainly with hypomenorrhea and polymenorrhea, whereas hypothyroidism is associated mainly with oligomenorrhea. Thyroid dysfunction has also been linked to reduced fertility. Controlled ovarian hyperstimulation leads to important increases in estradiol, which in turn may have an adverse effect on thyroid hormones and TSH. When autoimmune thyroid disease is present, the impact of controlled ovarian hyperstimulation may become more severe, depending on preexisting thyroid abnormalities. Autoimmune thyroid disease is present in 5–20% of unselected pregnant women. Isolated hypothyroxinemia has been described in approximately 2% of pregnancies, without serum TSH elevation and in the absence of thyroid autoantibodies. Overt hypothyroidism has been associated with increased rates of spontaneous abortion, premature delivery and/or low birth weight, fetal distress in labor, and perhaps gestation-induced hypertension and placental abruption. The links between such obstetrical complications and subclinical hypothyroidism are less evident. Thyrotoxicosis during pregnancy is due to Graves' disease and gestational transient thyrotoxicosis. All antithyroid drugs cross the placenta and may potentially affect fetal thyroid function. **(*Endocrine Reviews* 31: 702–755, 2010)**

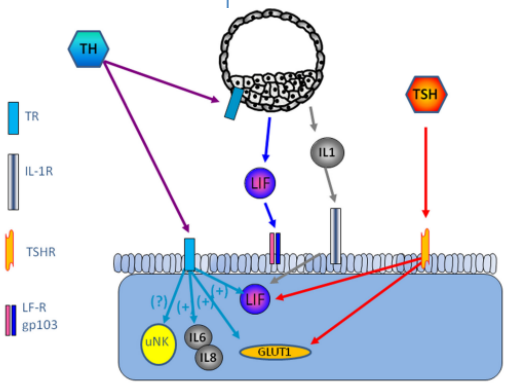
Ipotiroidismo e fertilità

Female









Azione sinergica degli OT con FSH

OT: esercitano effetti stimolatori diretti sulla funzione delle cellule della granulosa, come la differenziazione morfologica e la formazione del recettore LH/hCG

Aghajanova, 2009

Condivisione di Ag tra oocita e tiroide

Zona pellucida: bersaglio di AbTg, AbTPO

Monteleone, 2010

A livello endometriale sono presenti recettori per ormoni tiroidei e TSH ed aumentano nella fase recettiva

OT: ruolo fondamentale durante l'impianto e i primi stages dello sviluppo embrionale

Stavreus, 2012

Cambiamenti ormonali nella donna ipotiroidea

SHBG	↓
E2	↓
Estrone	↓
Produzione estrogeni	N o ↓
Clearance estrogeni e androgeni	↓
E2 libero	N
Testosterone	↓
Androstenedione	↓
Testosterone libero	↓
Conversione testo→androstenedione	↑
Progesterone	N o ↓
LH	N
FSH	N ↓
Dopo stimolo con GnRH	
LH	↓
FSH	↓

La disfunzione tiroidea può determinare la presenza di:

- **Cicli anovulatori**
- **Difetti della fase luteinica**
- **Elevazione dei livelli di PRL**
- **Alterazione degli ormoni sessuali**

Aumento della subfertilità/infertilità

Le alterazioni del metabolismo steroideo scompaiono al ripristino dell'eutiroidismo.

Redmond GP 2004, Longcope C 1990, Gallagher TF 1966, Gordon GG 1977, Larsen PR 1998

Ipotiroidismo e fertilità

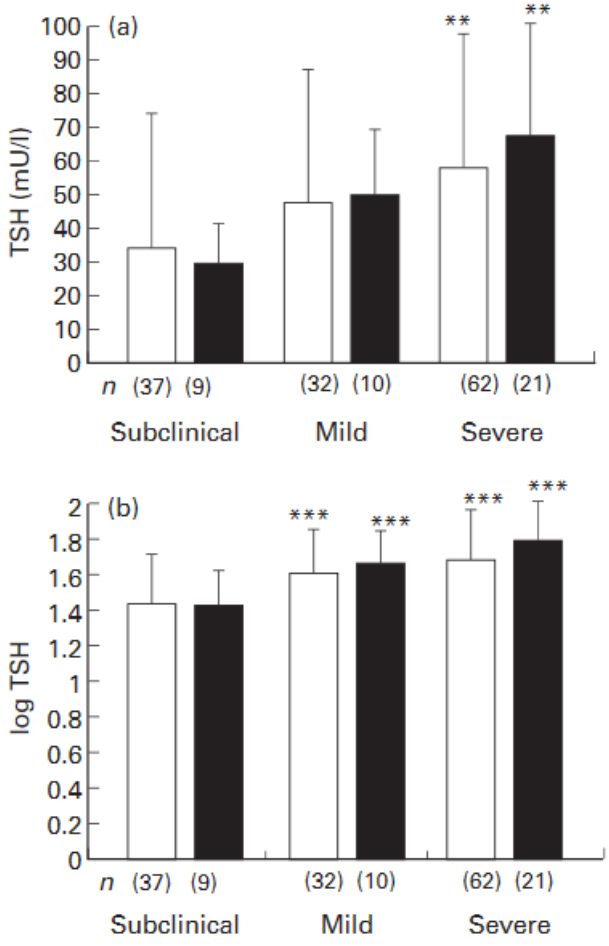


Fig. 1 TSH (a) and log TSH (b) levels in different subgroups of hypothyroid patients with (■) or without (□) menstrual disturbances. **Statistically significant, $P<0{\cdot}01$; *** Statistically significant, $P<0{\cdot}001$.

Hypothyroid women with TSH concentrations ≥15 mIU/L have a high rate of irregular menses (68%) compared with a 12% rate of menstrual irregularities reported by euthyroid women.

Table 1 Number (%) of patients and type of menstrual disturbance in hypothyroid patients before and after thyroxine treatment and in normal controls

Type of menstrual disturbance	Normal controls ($n=214$)		Hypothyroid patients ($n=171$)			
			Before LT_4		After LT_4	
	n	%	*n*	%	*n*	%
Oligomenorrhoea	12	67	17	42·5	8	50
Amenorrhoea	–	–	5	12·5	1	6
Polymenorrhoea	1	5·5	–	–	–	–
Hypomenorrhoea	3	16·5	6	15	4	25
Hypermenorrhoea/menorrhagia	2	11	12	30	3	19
Total	18	8·4	40	23·4*	16	9·3

* Statistically significant percentage in comparison with that of normal controls, $P<0{\cdot}001$.

Krassas GE et al, Clin Endocrinol (Oxf). 1999;50(5):655–659

Roma, 8-11 novembre 2018

Ipotiroidismo e fertilità

ITALIAN CHAPTER

Parameter	OH (n = 21)	SCH (n = 21)	CG (n = 32)	P-value (ANOVA)	P-value (post-hoc)
Age [years]	35.4 ±5.9	34.2 ±4.7	32.0 ±5.1	0.06	
Weight [kg]	72.4 ±13.9	67.8 ±17.4	63.9 ±11.4	0.10	
Height [cm]	162.1 ±6.6	162.2 ±5.7	161.2 ±5.0	0.78	
BMI [kg/m^2]	27.6 ±5.7	25.8 ±6.8	24.5 ±3.9	0.13	
Waist [cm]	91.4 ±14.6	85.6 ±16.1	83.8 ±13.0	0.17	
TPOAb (< 115 IU/ml)	281.9 ±119.6	152.0 ±190.9	17.8 ±7.7	**< 0.001**	a: **p = 0.002***
					b: **p < 0.001***
					c: **p < 0.001***
TgAb (< 34 IU/ml)	265.8 ±154.6	170.5 ±154.9	20.3 ±5.2	**< 0.001**	a: p = 0.08*
					b: **p < 0.001***
					c: **p = 0.01***
TSH (0.27–4.2 µU/ml)	12.1 ±3.4	4.5 ±2.0	2.0 ±1.1	**< 0.001**	a: **p < 0.001***
					b: **p < 0.001***
					c: **p = 0.009***
fT3 (2.1–4.4 pg/ml)	1.8 ±0.3	2.2 ±0.1	2.9 ±0.3	**0.03**	a: p = 0.345*
					b: **p = 0.03***
					c: p = 0.092*
fT4 (0.8–2.7 ng/dl)	0.7 ±0.2	1.1 ±0.1	1.1 ±0.1	0.016	a: **p < 0.001***
					b: **p < 0.001***
					c: p = 0.665*
Age at menarche [years]	12.8 ±1.2	13.0 ±1.2	12.7 ±1.4	0.08	
Number of children	2.5 ±1.0	2.4 ±1.1	2.4 ±1.0	0.09	
FSH (1.4–9.9 mIU/ml)	9.5 ±13.4	9.1 ±7.3	5.9 ±2.2	0.25	
LH (2.4–12.6 mIU/ml)	10.8 ±9.7	10.6 ±7.2	8.4 ±7.3	0.18	
E2 (12.5–166 pg/ml)	99.4 ±134.1	103.4 ±109.9	144.8 ±119.8	0.09	
Mean AMH concentration [ng/ml]	1.5 ±1.3	1.8 ±2.2	2.1 ±1.4	0.19	
Total AFC	12.8 ±8.6	12.5 ±4.8	11.6 ±3.8	0.80	

Evaluation of ovarian reserve in women with overt or subclinical hypothyroidism

Thyroid. 2016 Apr;26(4):580-90.

Ferit Kerim Kucukler[1], Umit Gorkem[2], Yasin Simsek[3], Ramazan Kocabas[4], Serdar Guler[1]

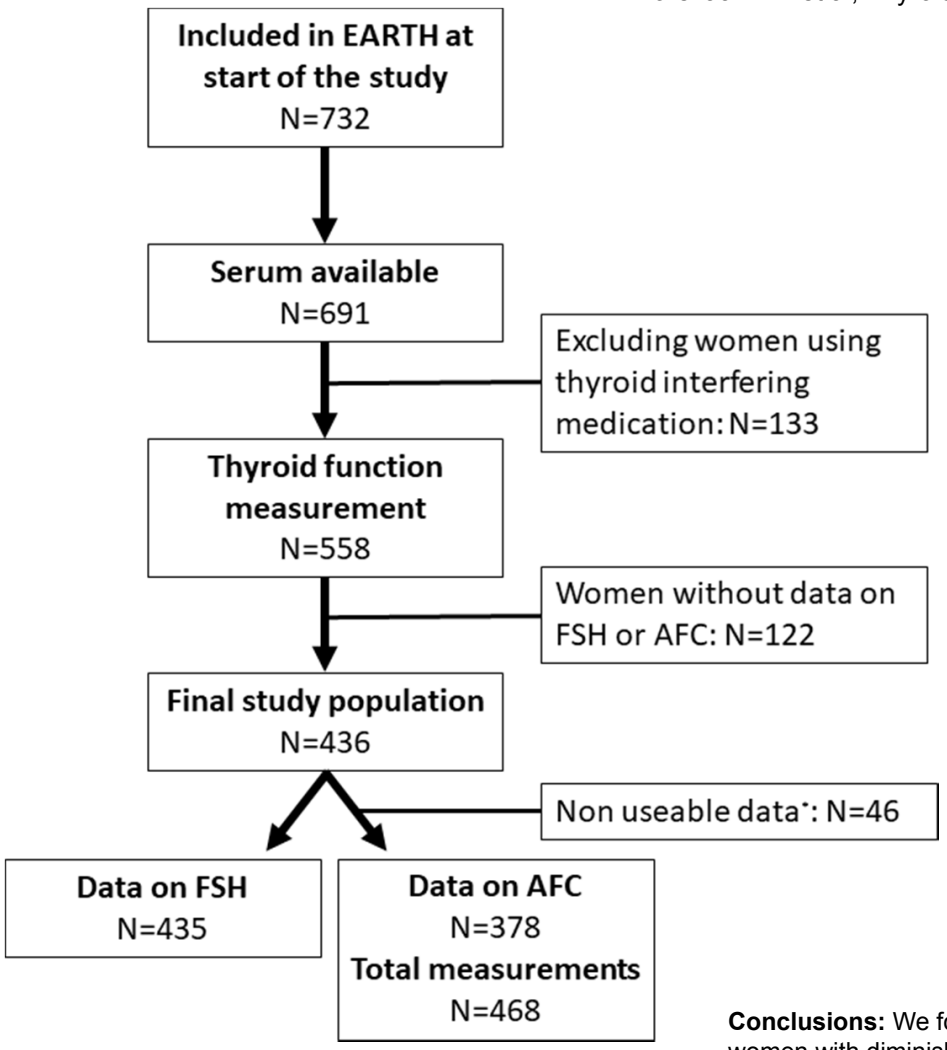
In conclusion, we found no significant difference between patients with overt or subclinical hypothyroidism and control in regard to ovarian reserves measured by serum AMH concentration and total AFC. However, the lower AMH concentration found in OH and SCH patients may be suggestive for close follow-up of these patients. Further, larger prospective studies are needed to confirm these findings.

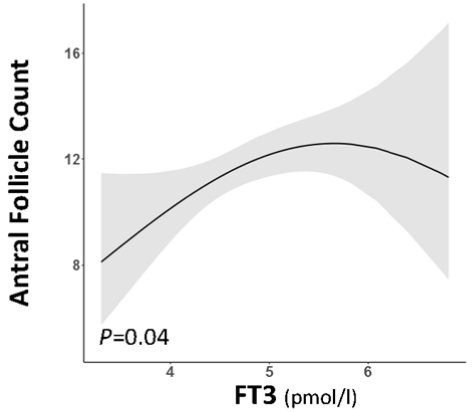
Anti-Müllerian hormone (AMH)

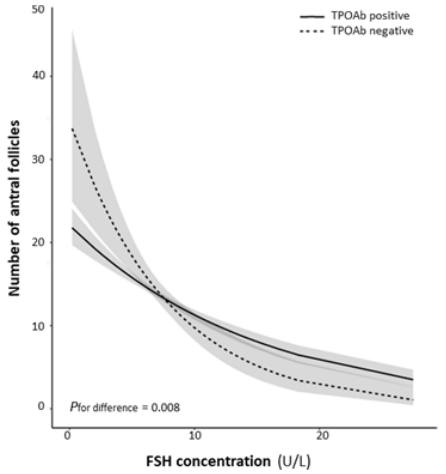
Antral follicle count (AFC)

Ipotiroidismo e fertilità

Korevaar Tim et al, Thyroid, Nov. 2018 on line







Conclusions: We found that lower FT3 and TPOAb positivity are associated with a lower AFC in women with diminished ovarian reserve or unexplained infertility.

Prevalence of hypothyroidism in infertile women and evaluation of response of treatment for hypothyroidism on infertility

Indu Verma, Renuka Sood, Sunil Juneja[1], Satinder Kaur

Departments of Biochemistry and [1]Gynecology, Dayanand Medical College and Hospital, Ludhiana, Punjab, India

Abstract

Context: Prevalence of hypothyroidism is 2–4% in women in the reproductive age group. Hypothyroidism can affect fertility due to anovulatory cycles, luteal phase defects, hyperprolactinemia, and sex hormone imbalance. **Aims and Objectives:** To study the prevalence of clinical/sub-clinical hypothyroidism in infertile women and the response of treatment for hypothyroidism on infertility. **Materials and Methods:** A total of 394 infertile women visiting the infertility clinic for the first time were investigated for thyroid stimulating hormone (TSH) and prolactin (PRL). Infertile women with hypothyroidism alone or with associated hyperprolactinemia were given treatment for hypothyroidism with thyroxine 25–150 µg. **Results:** Of 394 infertile women, 23.9% were hypothyroid (TSH > 4.2 µIU/ml). After treatment for hypothyroidism, 76.6% of infertile women conceived within 6 weeks to 1 year. Infertile women with both hypothyroidism and hyperprolactinemia also responded to treatment and their PRL levels returned to normal. **Conclusion:** Measurement of TSH and PRL should be done at early stage of infertility check up rather than straight away going for more costly tests or invasive procedures. Simple, oral hypothyroidism treatment for 3 months to 1 year can be of great benefit to conceive in otherwise asymptomatic infertile women.

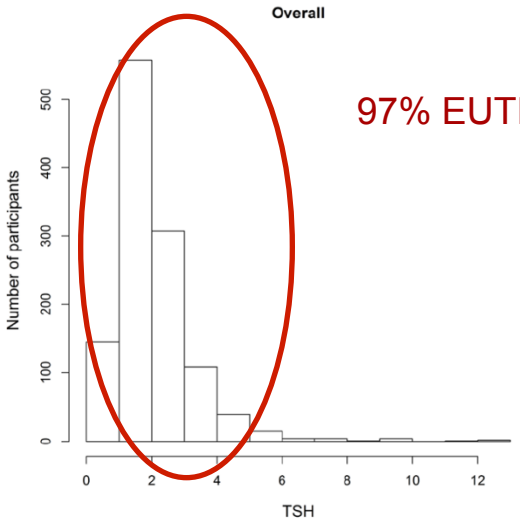
International Journal of Applied and Basic Medical Research, Jan-Jun 2012,

Ipotiroidismo e fertilità

ORIGINAL ARTICLE

Subclinical Hypothyroidism and Thyroid Autoimmunity Are Not Associated With Fecundity, Pregnancy Loss, or Live Birth

Supplemental Figure 1. Distribution of TSH levels among women with normal fT4 (0.7 to 1.85 ng/dL) in the EAGeR Trial.



97% EUTIROIDEA

Table 1. De… hyroid Antibodies Among Women with N…

Characteristics		d Antibodies (Presence of r Anti-TG Antibodies)	
		Positive	*P* Value
n		168	
TSH		2.9 ± 2.2	<.001
fT_4		1.1 (0.2)	.292

Conclusions … TSH levels ≥ 2.5 mIU/L or the prese… dity, pregnancy loss, or live birth. Th… nunity can be reassured that their chances of conceiving and achieving a live birth are likely unaffected by marginal thyroid dysfunction. (***J Clin Endocrinol Metab*** **101: 2358–2365, 2016)**

Research Article

Impaired Fertility Associated with Subclinical Hypothyroidism and Thyroid Autoimmunity: The Danish General Suburban Population Study

Table 1: Characteristics of women in The Danish General Suburban Population Study (GESUS).

	All	Mild (subclinical) hypothyroidism		
		No	yes	*P*-value
N (%)	11254 (100)	8770	758	
Age	56.3 (45.5–66.2)	55.4 (44.8–65.6)	55.6 (44.9–65.9)	0.43
Menopause, yes (%)	7129 (63.4)	5405 (61.6)	463 (61.1)	0.77
TSH, mU/L	1.8 (1.2–2.6)	1.7 (1.2–2.3)	4.6 (4.1–5.5)	<0.001
Total T3, nmol/L	1.6 (1.5–1.9)	1.7 (1.5–1.9)	1.6 (1.5–1.8)	0.38
Free T4, pmol/L	15 (14–17)	15 (14–17)	14 (13–15)	<0.001
TPOAb, U/mL	13 (20–32)	19 (12–27)	28 (15–699)	<0.001
Body mass index (BMI), kg/m^2	25.3 (22.6–28.8)	25.2 (22.5–28.7)	25.5 (22.8–29.2)	0.06
Smoker, yes (%)	1899 (16.9)	1527 (17.5)	66 (8.7)	<0.001
Prevalent hypothyroidism, yes (%)	922 (9.4)	NA	NA	
Prevalent hyperthyroidism, yes (%)	391 (4.2)	NA	NA	
Diabetes mellitus, yes (%)	576 (5.1)	392 (4.5)	40 (5.3)	0.31
Antihypertensive medication, yes (%)	2457 (21.8)	1816 (20.7)	140 (18.5)	0.14
Cholesterol lowering medication, yes (%)	1510 (8.5)	1096 (12.5)	91 (12.0)	0.69
Contraception, yes (%)	953 (8.5)	772 (8.8)	66 (8.7)	0.93
Income below EUR 60,000 €	4744 (43.7)	3588 (42.4)	292 (40.1)	0.25
Unemployment, yes (%)	6284 (55.8)	3690 (42.1)	318 (42.0)	0.95
Education, no (%)	1713 (15.2)	1291 (14.7)	95 (12.5)	0.57
Age at 1st child born	25 (22–28)	25 (22–28)	25 (22–29)	0.02
No children born, *N* (%)	1171 (10.5)	897 (10.3)	98 (13.0)	0.02
No pregnancies, *N* (%)	952 (8.5)	733 (8.4)	77 (10.2)	0.09
Spontaneous abortion, yes (%)	2261 (21)	1747 (20.8)	149 (20.6)	0.87

For continuous variables: median (interquartile range).
For SCH, *P* value: Chi-square for categorical comparisons and ranksum or Kruskal-Wallis test for continuous comparisons.

5. Conclusion

Taken together, we observed that with higher TSH levels the less number of children born and the less number of pregnancies. Furthermore, with higher TPOAb levels the less number of children born. Mild hypothyroidism was also associated with a higher age of first child born and risk of not having children and not getting pregnant. In conclusion, we observed that impaired fertility is associated with TSH, TPOAb, and mild (subclinical) hypothyroidism in a Danish population of women.

Feldthusen A et al, Journal of Pregnancy, 2016

Roma, 8-11 novembre 2018

Ipotiroidismo e fertilità

ITALIAN CHAPTER

GYNECOLOGICAL ENDOCRINOLOGY
https://doi.org/10.1080/09513590.2018.1499087

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ORIGINAL ARTICLE

Levothyroxine supplementation on assisted reproduction technology (ART) outcomes in women with subtle hypothyroidism: a retrospective study

Fiore Pelliccione[a], Andrea Lania[a], Alessandro Pizzocaro[a], Luca Cafaro[b], Luciano Negri[c], Emanuela Morenghi[d], Nazarena Betella[a], Marta Monari[e] and Paolo Emanuele Levi-Setti[f,g]

Table 3. ART outcomes in treated hypothyroid and euthyroid women.

Outcome	L-T4 treated women	Euthyroid women	*p* Value
Retrieved oocytes (*n*)	9.93 ± 5.44	10.08 ± 5.68	.605
Mature oocytes (*n*)	8.64 ± 5.10	8.72 ± 5.27	.818
M2 oocytes post denuding	7.28 ± 4.37	7.35 ± 4.53	.985
Fertilized oocytes (*n*)	4.11 ± 2.20	4.04 ± 2.23	.295
Fertilization rate (%)	69.78%	70.25%	.387
Cycles with failed fertilization	81 (5.04%)	283 (5.73%)	.316
Total number of embryos (*n*)	4.02 ± 2.16	3.95 ± 2.21	.198
Transferred embryos (*n*)	2.03 ± 0.82	1.97 ± 0.85	.022
Embryo implantation rate (%)	13.09%	14.15%	.122
Clinical pregnancy rate/cycle [*n* (%)]	445 (27.67%)	1302 (26.37%)	.314
Clinical pregnancy rate/embryo transfer	445 (30.13%)	1302 (29.17%)	.489
Miscarriage rate/pregnancy [*n* (%)]	80 (17.98%)	241 (18.51%)	.832
Pregnancy termination for fetal anomaly	5 (1.12%)	17 (1.31%)	1.000
Ectopic pregnancies	9 (0.56%)	27 (0.55%)	1.000
Live birth rate/cycle [*n* (%)]	347 (21.58%)	1006 (20.38%)	.304
Live birth rate/embryo transfer [*n* (%)]	347 (23.49%)	1006 (22.54%)	.449
Gestational age (weeks)			
Singleton birth	38.8 ± 2.0	38.6 ± 2.4	.354
Twin births	35.6 ± 2.0	35.3 ± 2.5	.809
Triplets births	29.3 ± 3.8	30.9 ± 3.0	.553
Birth weight (kg)			
Singleton birth	3142 ± 601	3087 ± 574	.267
Twin births	2275 ± 448	2240 ± 536	.509
Triplets births	1206 ± 585	1408 ± 665	.498
Total number of children delivered	427	1263	
Neonatal anomalies	4 (0.94%)	20 (1.58%)	.478

Values are expressed as mean ± SD or number (percentage of category) unless otherwise noted.

Table 1. Baseline characteristics of treated hypothyroid and euthyroid women included in the study.

Parameters	L-T4 treated women	Euthyroid women	*p* Value
No. of patients/cycles	1074/1608	3073/4937	–
Age (years)	35.6 ± 3.3	35.6 ± 3.4	.914
BMI (kg/m^2)	22.5 ± 3.5	22.1 ± 3.2	<.001
TSH (mIU/mL)	1.43 ± 0.69	1.52 ± 0.52	.544
FSH	7.53 ± 2.79	7.34 ± 2.75	.009
AMH (ng/mL)	2.52 ± 3.22	2.69 ± 5.09	.846
Total AFC (*n*)	8.68 ± 6.97	8.72 ± 6.86	.836

Values are expressed as mean ± SD.

Conclusions

In conclusion, thyroid function assessment in infertile women scheduled for ART is mandatory and L-T4 treatment should be offered timely in the presence of a TSH >2.5 mUI/L before starting COH to mitigate the effects of hypothyroidism on IVF/ICSI outcomes.

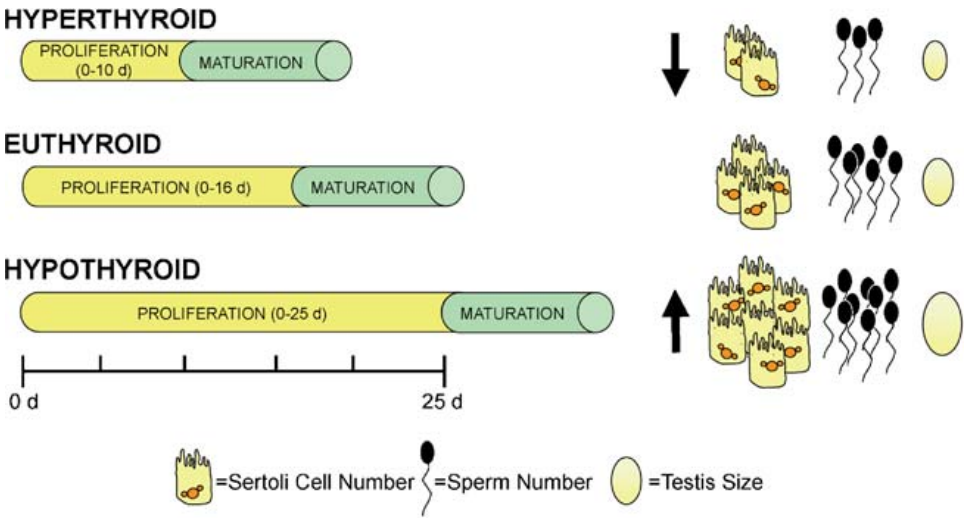
Ipotiroidismo e fertilità

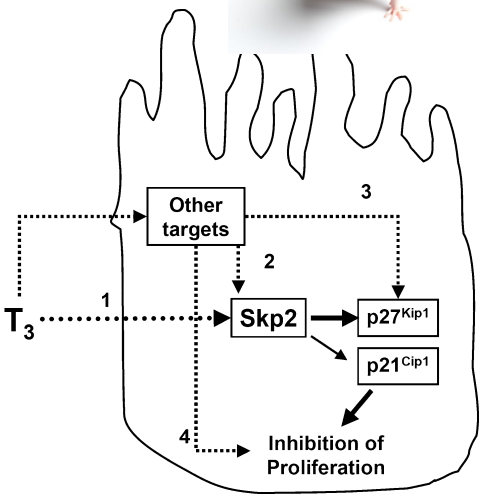
Male

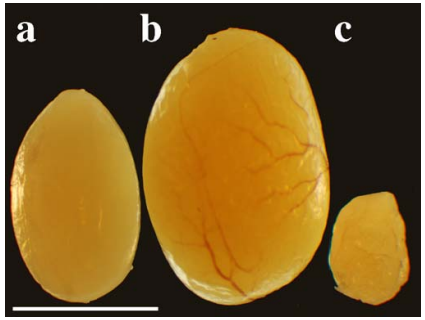
Ipotiroidismo e fertilità

Denise R. Holsberger · Paul S. Cooke

Understanding the role of thyroid hormone in Sertoli cell development: a mechanistic hypothesis







Cell Tissue Res (2005) 322: 133–140

Ipotiroidismo e fertilità

Leydig Cells Increase Their Numbers but Decline in Steroidogenic Function in the Adult Rat after Neonatal Hypothyroidism*

MATTHEW P. HARDY, JOHN D. KIRBY, REX A. HESS, AND PAUL S. COOKE

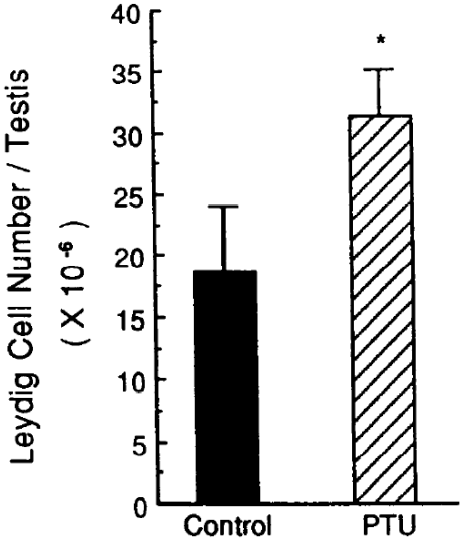


FIG. 1. The number of Leydig cells per testis (mean ± SEM). ■, Cor ▨, PTU-treated. ★, Significantly different at $P < 0.05$.

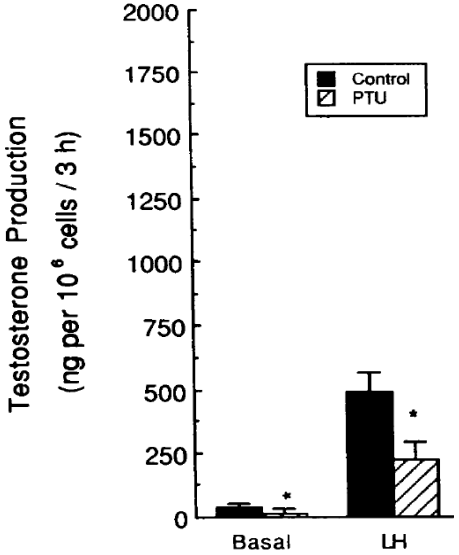


FIG. 2. Testosterone production by purified Leydig cells *in vitro* (mean ± SEM). ■, Control; ▨, PTU-treated.

Conclusion: "..the dramatic increase in adult Leydig cell after neonatal PTU treatment is counterbalanced by a permanent decline in Leydig cell steroidogenic function".

Ipotiroidismo e fertilità

Ontogenetic Pattern of Thyroid Hormone Receptor Expression in the Human Testis

EMMANUELE A. JANNINI, ANNA CRESCENZI, NADIA RUCCI, EMILIANO SCREPONI, ELEONORA CAROSA, ANNA DE MATTEIS, ENRICO MACCHIA, GIULIA D'AMATI, AND MASSIMINO D'ARMIENTO

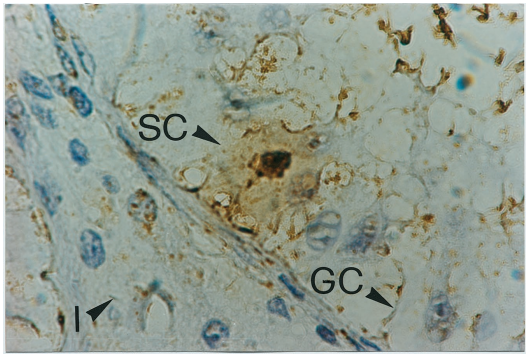
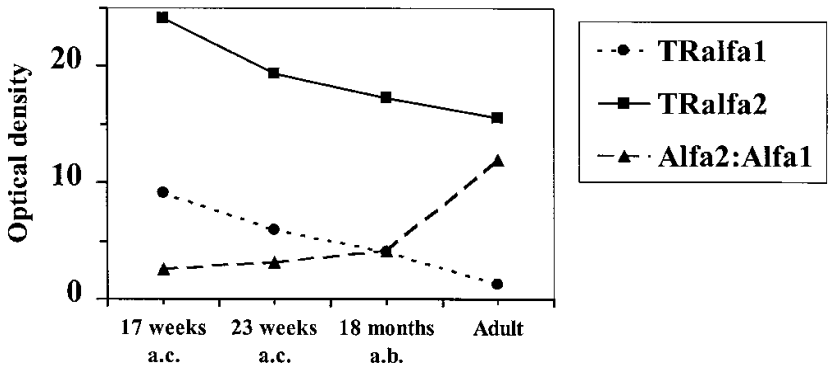


FIG. 5. Localization of TR_{α} mRNAs by *in situ* hybridization. The biotinylated oligos used in Fig. 2 have been hybridized with testis sections from a patient of 26 months. SC, Sertoli cells; GC, germ cells; I, interstitium. Original magnification, ×100.



JCEM vol.85, No. 9, 2000

Roma, 8-11 novembre 2018

Ipotiroidismo e fertilità

ITALIAN CHAPTER

J Pediatr. 1988 Mar;112(3):397-402.

Hypothalamic-pituitary gonadal axis in boys with primary hypothyroidism and macroorchidism.

Castro-Magaña M[1], Angulo M, Cañas A, Sharp A, Fuentes B.

Author information

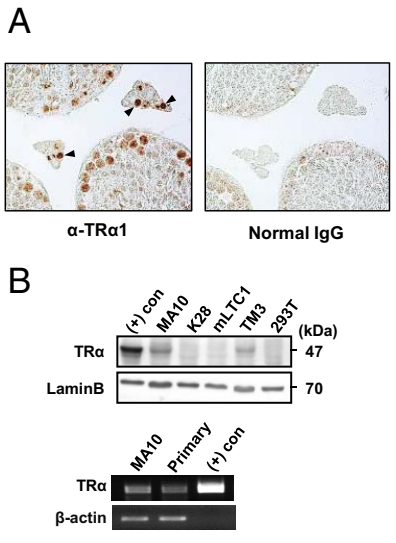
Abstract

Nine of 15 boys with severe long-standing primary hypothyroidism were found to have macroorchidism. All 15 patients had elevated thyroid-stimulating hormone levels. However, only those patients with testicular enlargement had striking elevations of serum prolactin and gonadotropin values. The response to gonadotropin-releasing hormone in our patients was blunted, in contradistinction to that of children with true precocious puberty. In spite of the elevated levels of luteinizing hormone, the serum testosterone levels were in the prepubertal range, explaining the lack of peripheral manifestations of androgenic effect. Improvement of testosterone secretion followed decreasing prolactin levels with bromocriptine administration, suggesting an inhibitory effect of prolactin on luteinizing hormone action at the Leydig cell. We conclude that testicular enlargement is the result of continuous follicle-stimulating hormone stimulation and that the term "true precocious puberty" is not appropriate in children with hypothyroidism and macroorchidism unless the hypothalamic-pituitary gonadal axis is shown to be at the pubertal stage.

ORIGINAL RESEARCH

Differential Regulation Of Steroidogenic Enzyme Genes by TRα Signaling in Testicular Leydig Cells

Eunsook Park,* Yeawon Kim,* Hyun Joo Lee, and Keesook Lee

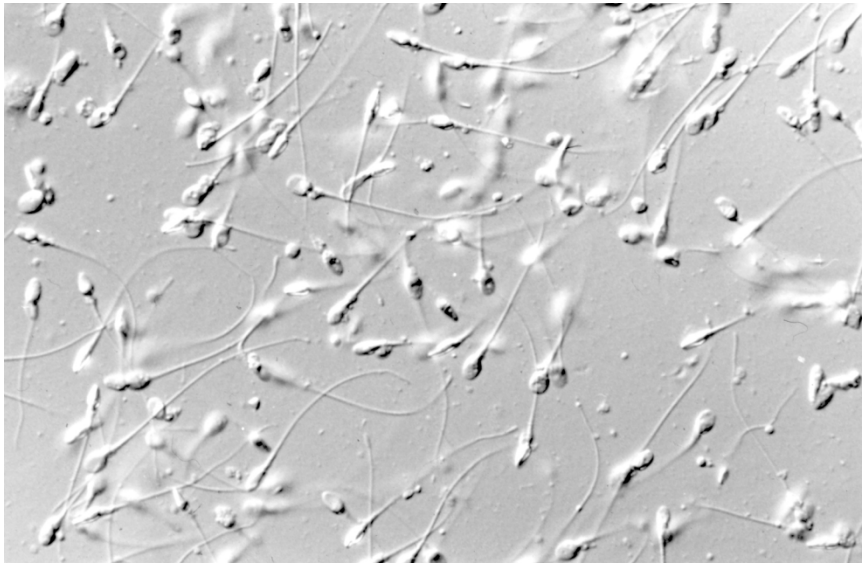


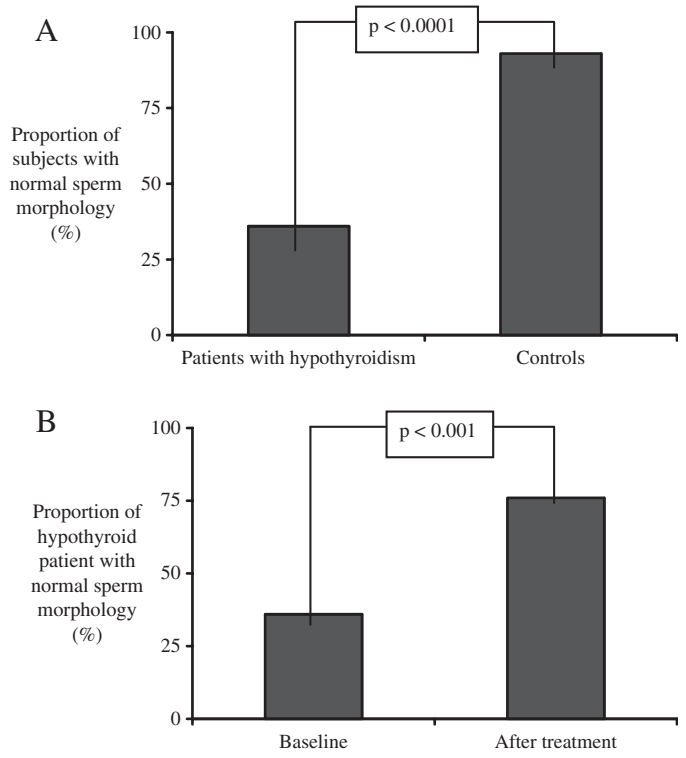
Mol Endocrinol, vol.28, No. 6, 2014

Ipotiroidismo e fertilità

Hypothyroidism Has an Adverse Effect on Human Spermatogenesis: A Prospective, Controlled Study

Gerasimos E. Krassas,[1] Fotini Papadopoulou,[1] Kostas Tziomalos,[1] Theodosia Zeginiadou,[2] and Nikolaos Pontikides[1]





Conclusions: Hypothyroidism has an adverse effect on human spermatogenesis.

THYROID
Volume 18, Number 12, 2008

SEXUAL MEDICINE REVIEWS

REVIEW

The Impact of Thyroid Disease on Sexual Dysfunction in Men and Women

Andrew T. Gabrielson, BA, Rita A. Sartor, BA, and Wayne J. G. Hellstrom, MD, FACS

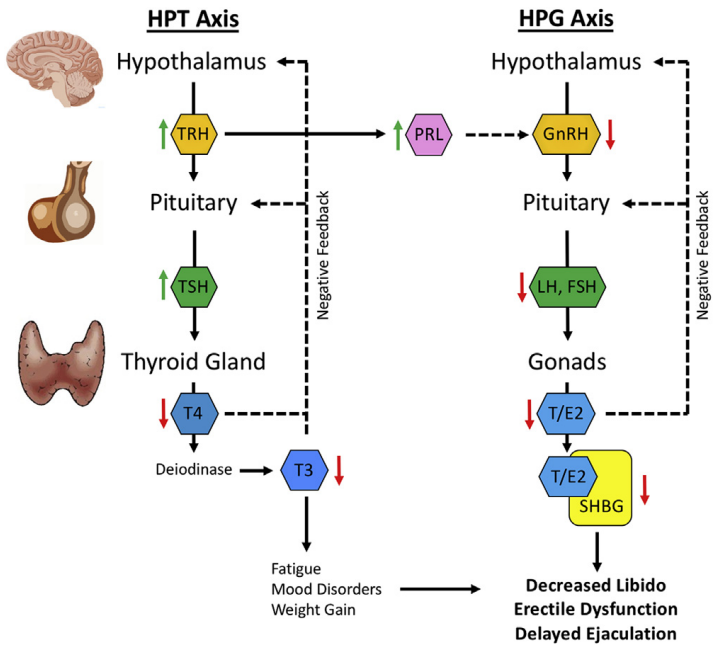


Figure 2. Schematic demonstrating the hormonal effects of hypothyroidism on sexual dysfunction via inter-actions between the hypo-thalamic-pituitary-thyroid (HPT) and hypo-thalamic-pituitary-gonadal (HPG) axes. Sequela of hypothyroidism include:

Table 3. Summary of available studies demonstrating an association between hypothyroidism and sexual dysfunction in men and women

Hypothyroidism		
Men		
Study	Patients	Results
Carani et al,[13] 2005	N = 14 Hypothyroid	9 (63.4%) had ED, HSDD, and DE
		1 (7.1%) had PE
		All patients had low total T, estradiol, SHBG*
Krassas et al,[14] 2008	N = 44 Hypothyroid	Higher rates of ED in hypothyroid arm compared to controls (63% vs 34%)*
	N = 71 Controls	SHIM scores inversely correlated with TSH*
Veronelli et al,[15] 2006	N = 55 Hypothyroid	Higher rates of all forms of ED (IIEF-5) in hypothyroid arm compared to controls*
	N = 109 Controls	
Corona et al,[20] 2012 (UNIFI cohort)	N = 3,203 Men presenting to sexual medicine clinic	TSH inversely correlated with ED after adjusting for age, smoking, T level, CDS*
		High TSH correlated with moderate to severe HSDD*
Wortsman et al,[39] 1987	N = 8 Hypothyroid	7 (88%) had Low libido of >1 y duration since diagnosis with hypothyroidism
Jaya Kumar et al,[28] 1990	N = 8 Hypothyroid	3 (38%) had Low libido

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Ipotiroidismo e fertilità

ITALIAN CHAPTER

Sexual Dysfunction and Infertility

The Role of Hypothyroidism in Male Infertility and Erectile Dysfunction

Mohammad Reza Nikoobakht,[1] Mehdi Aloosh,[1,2] Nafiseh Nikoobakht,[1] Abdolrasoul Mehrsay,[1] Farzad Biniaz,[3] Mohammad Amin Karjalian[1]

Table 1. Characteristics, hormonal, and seminal parameters of participants

	Hypothyroid group	Normal group		
	Mean ± SD	Mean ± SD	*P*	95% Confidence Interval
Participants, n	24	66	-	-
Age, y	43.1± 11.6	41.5 ± 69	.45	-4.09 to 7.19
IIEF-5 score	11.75 ± 4.84	20.81 ± 3.21	.005	-10.82 to -7.31
FSH, mU/mL	8.70 ± 4.17	7.51 ± 7.37	.342	-1.29 to 3.67
LH, mU/mL	7.40 ± 3.70	6.58 ± 2.62	.327	-0.85 to 2.49
Free testosterone, pg/mL	5.40 ± 2.27	17.73 ± 98.09	.311	-36.45 to 11.80
Prolactin, ng/mL	359.41 ± 77.57	290.13 ± 96.86	.001	29.48 to 109.08
Sperm count, million/mL	28.04 ± 25.72	72.98 ± 42.72	.000	-59.82 to -30.05
Sperm motility, %	30.08 ± 18.53	67.39 ± 12.20	.000	-45.61 to -29.00
Sperm morphology, %	35.12 ± 13.87	65.10 ± 11.28	.000	-36.38 to -23.57

SD indicates standard deviation; IIEF-5, International Index of Erectile Function questionnaire; FSH, follicle-stimulating hormone; and LH, luteinizing hormone.

Urology Journal, 2012

Roma, 8-11 novembre 2018

Ipotiroidismo e fertilità

ITALIAN CHAPTER

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Weiss RV et al. Arq Bras Endocrinol Metabol. (2014)

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