Endocrinol Nutr. 2015;62(7):322–330

ENDOCRINOLOGÍA Y NUTRICIÓN

www.elsevier.es/endo

ORIGINAL ARTICLE

Cost-effectiveness analysis of universal screening for thyroid disease in pregnant women in Spain☆

Sergio Donnay Candil[a,*], José Antonio Balsa Barro[b], Julia Álvarez Hernández[c], Carlos Crespo Palomo[d], Ferrán Pérez-Alcántara[e], Carlos Polanco Sánchez[f]

[a] *Unidad de Endocrinología y Nutrición, Hospital Universitario Fundación Alcorcón, Madrid, Spain*
[b] *Servicio de Endocrinología y Nutrición, Hospital Universitario Infanta Sofía, Madrid, Spain*
[c] *Servicio de Endocrinología y Nutrición, Hospital Universitario Príncipe de Asturias, Alcalá de Henares, Madrid, Spain*
[d] *Departamento de Estadística, Universidad de Barcelona, Barcelona, Spain*
[e] *Oblikue Consulting, Barcelona, Spain*
[f] *Economía de la Salud, Corporate Affairs, Merck S.L., Spain*

Received 19 November 2014; accepted 16 March 2015
Available online 9 September 2015

KEYWORDS
Cost effectiveness analysis;
Hypothyroidism;
Subclinical hypothyroidism;
Pregnant women

Abstract
Objective: To assess the cost-effectiveness of universal screening for thyroid disease in pregnant women in Spain as compared to high risk screening and no screening.
Methodology: A decision-analytic model comparing the incremental cost per quality-adjusted life year (QALY) of universal screening versus high risk screening and versus no screening was used for the pregnancy and postpartum period. Probabilities from randomized controlled trials were considered for adverse obstetrical outcomes. A Markov model was used to assess the lifetime period after the first postpartum year and account for development of overt hypothyroidism. The main assumptions in the model and use of resources were assessed by local clinical experts. The analysis considered direct healthcare costs only.
Results: Universal screening gained .011 QALYs over high risk screening and .014 QALYS over no screening. Total direct costs per patient were €5786 for universal screening, €5791 for high risk screening, and €5781 for no screening. Universal screening was dominant compared to risk-based screening and a very cost-effective alternative as compared to no screening. Use of universal screening instead of high risk screening would result in €2,653,854 annual savings for the Spanish National Health System.

☆ Please cite this article as: Donnay Candil S, Balsa Barro JA, Álvarez Hernández J, Crespo Palomo C, Pérez-Alcántara F, Polanco Sánchez C. Análisis coste-efectividad del cribado universal de la enfermedad tiroidea en mujeres embarazadas en España. Endocrinol Nutr. 2015;62:322–330.

* Corresponding author.
E-mail address: SDonnay@fhalcorcon.es (S. Donnay Candil).

Conclusions: Universal screening for thyroid disease in pregnant women in the first trimester is dominant in Spain as compared to risk-based screening, and is cost-effective as compared to no screening (incremental cost-effectiveness ratio of €374 per QALY). Moreover, it allows diagnosing and treating cases of clinical and subclinical hypothyroidism that may not be detected when only high-risk women are screened.

PALABRAS CLAVE
Análisis coste-efectividad;
Hipotiroidismo;
Hipotiroidismo subclínico;
Mujeres embarazadas

Análisis coste-efectividad del cribado universal de la enfermedad tiroidea en mujeres embarazadas en España

Resumen
Objetivo: Evaluar la relación coste-efectividad del cribado universal para la enfermedad tiroidea en mujeres embarazadas frente al cribado selectivo y no realizar cribado.
Metodología: Modelo analítico de decisión para embarazo y periodo posparto que compara los años de vida ajustados por la calidad (AVAC) obtenidos gracias a la realización de un cribado universal frente al cribado de alto riesgo y no realizar cribado. Se consideraron las probabilidades de los ensayos aleatorios controlados para los resultados obstétricos adversos. Se utilizó un modelo de Markov para valorar el período de vida tras el primer año después del parto y considerar la posible progresión a hipotiroidismo clínico. Los principales supuestos del modelo, así como el uso de recursos fueron evaluados por expertos clínicos. Se consideraron únicamente los costes sanitarios directos.
Resultados: Realizar un cribado universal produce 0,011 AVAC más que el cribado selectivo y 0,014 AVAC más que la alternativa de no realizar cribado. Los costes totales directos por paciente fueron de 5.786€ para el cribado universal, 5.791€ para cribado por riesgo y de 5.781€ sin cribado. El paso del cribado selectivo por riesgo al cribado universal puede ahorrar 2.653.854€ al sistema sanitario español.
Conclusiones: El cribado universal de enfermedad tiroidea durante el primer trimestre de gestación es una estrategia dominante frente al cribado selectivo y coste-efectiva con respecto al no cribado (ratio coste-efectividad incremental de 374€ por AVAC), que permite además diagnosticar y tratar casos de hipotiroidismo clínico y subclínico que podrían no ser detectados al cribar solo mujeres con alto riesgo.

Introduction

The prevalence of clinical hypothyroidism (CH) during pregnancy ranges from 0.3% to 0.5%, while the prevalence of subclinical hypothyroidism (SH) ranges from 2% to 3%.[1,2] These subclinical thyroid function disorders are the most common functional abnormalities in pregnant women with thyroid diseases.

Hypothyroidism during pregnancy is usually asymptomatic. In the most severe cases, both SH and CH may cause some signs and symptoms such as inadequate weight gain, cold intolerance, asthenia, and dry skin.[3] During pregnancy, SH and CH may cause adverse obstetric outcomes such as premature placental detachment and preterm delivery, as well as more frequent admission to neonatal intensive care units.[1,4,5] On the other hand, pregnant women with positive thyroid peroxidase (TPO) antibodies have significantly higher thyroid-stimulating hormone (TSH) levels as compared to women with negative TPO antibodies[5] and have been reported to have an increased fetal loss rate.[3,5–7]

The diagnosis of CH and SH during pregnancy requires understanding of the specific changes in thyroid function during each trimester.[8] Since CH/SH was identified as a cause of maternal and fetal morbidity, there has been controversy about the convenience of the universal screening of thyroid function during pregnancy or selective screening based on risk factors (women with a family history of thyroid disease, type 1 diabetes mellitus, thyroid disorder, premature delivery, radiation therapy to the head or neck, amongst others). Selective screening for risk factors has been the preferred method because of its feasibility and because of the lack of studies showing the superiority of universal screening over risk-based screening. Recent studies have shown that screening women considered at high risk only means that 30–50% of women with CH or SH who could benefit from treatment are not identified.[9,10]

In Spain, only women at high risk for CH are currently screened. There is thus no program for thyroid dysfunction screening in the population, but only recommendations from the Working Group on Iodine Deficiency Disorders and Thyroid Dysfunction of the Spanish Society of Endocrinology and Nutrition and the Spanish Society of Gynecology and Obstetrics.[11]