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The possible relationship between menorrhagia and occult hypothyroidism in IUD-wearing women*

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Abstract

A high incidence of occult hypothyroidism in menorrhagic women has been reported and emphasized in recent studies. In order to verify this statement, we have evaluated the functional status of the thyroid gland in intrauterine device (IUD) wearers suffering from increased menstrual bleeding. The study group consisted of 40 IUD-wearing women, aged 26–46 years, suffering from metrorrhagia. The control group consisted of 38 IUD-fitted women, 22–44 years old, in whom menstrual bleeding was not significantly increased. Menorrhagia was defined as excessive vaginal bleeding lasting for 6 days or more, and/or containing a significant amount of blood clots.

Free thyroxine (FT) and thyroid-stimulating hormone (TSH) levels were assessed. FT levels were identical in both groups and within the normal range (1.31 ± 0.28 ng/dl). TSH levels were significantly higher in the study group than in the controls, although they remained within the normal range (2.75 ± 2.06 vs. 1.45 ± 0.45 μU/ml, $p<0.01$). A thyrotropin-releasing hormone (TRH) test was performed in 10 women having the highest TSH levels. All the results of TRH tests were consistent with occult hypothyroidism. These women were treated with L-thyroxine and all had a significant improvement in their bleeding within 3 months of treatment.

We concluded that any IUD-wearing woman suffering from menorrhagia may have occult hypothyroidism. Should FT and TSH be within normal limits, a TRH test should be performed as the definitive diagnostic test.

A frequent side-effect of intrauterine contraception is menometrorrhagia. The intrauterine device (IUD) has to be removed in 5–15% of cases to prevent iron deficiency anemia [1–3].

*This work is part of G. Blum's MD thesis

Menorrhagia is common in hypothyroidism [4,5], and even a mild hypothyroid state in IUD-wearing women will not respond to conventional treatment like prostaglandin synthetase inhibitors (PGSI) or antifibrinolytics.

The aim of our study was to show that occult thyroid disease must be ruled out in every IUD wearer with severe menorrhagia. Identifying patients with occult hypothyroidism is of great importance and, to the best of our knowledge, such a study has not yet been performed.

Population and method

Our study group (Group A) consisted of 40 women attending the Family Planning Clinic 'Mishmar Hayarden', 20 fitted with a Nova-T (NT, Schering, Berlin) and 20 with a Multiload (ML375, Holland), who complained of heavy menorrhagia (lasting more than 6 days) containing a significant number of blood clots at their follow-up visit, 2 months after the insertion of an IUD. Their age ranged from 26 to 46 years (mean age 37.5 years), all being parous with 2–5 normal deliveries (mean 2.9). A matched control group (Group B) of 38 women, aged 22–44 years (mean 37.7 years), was recruited by random selection. They were fitted with an IUD at the same time (18 with an NT and 20 with an ML 375); their past obstetric history included 2–7 deliveries (mean 3.3) with no complaints of bleeding at their follow-up visit.

After excluding local pathology by pelvic examination, all women underwent the routine laboratory analyses: hemoglobin, hematocrit and ferritin. The thyroid function was assessed by the following tests: free-thyroxine (FT) by a commercial kit (Coat-A-Count FT, Diagnostic Products Corp.), the normal values for our laboratory being 0.9–1.9 ng/dl; thyroid stimulating hormone (TSH), assessed by a commercial kit (TSHK-PR-ORIS), normal values ranging between 0.5 and 4.5 μU/ml.

Ten women with high normal TSH from Group A were referred to the Endocrinological Department for a thyrotropin-releasing hormone (TRH) test. In euthyroid women, the TSH level rises 2–3 times 20 minutes after injection of 200 mg TRH and becomes normal after 60 minutes. An increase in TSH to 30 μU/ml or 10 times greater than normal is considered as occult hypothyroidism.

Statistical analysis was performed by the Student's t-test.

Results

The results of our study are presented in Table 1. One can see that there was no difference in FT levels between the 2 groups (1.32 ± 0.29 ng/dl vs 1.31 ± 0.28 ng/dl, $p > 0.20$, not statistically significant).

TSH in Group A revealed a mean of 2.75 ± 2.06 μU/ml, a normal value, but significantly higher than in the control Group B (1.45 ± 0.45, $p < 0.01$). As mentioned, 10 women from Group A, those with the highest TSH levels, were referred for a TRH test. Twenty minutes after injection of 200 mg/ml of TRH, TSH increased to a value of 30 μU/ml, a clear indication for the diagnosis of occult hypothyroidism.

Table 1 Results of thyroid function tests in IUD-wearers with menorrhagia, and in normal controls

Group	*No. of patients*	*FT ng/dl*	*TSH μU/ml*
Group A	40	1.32 ± 0.28	2.75 ± 2.05
Group B	38	1.31 ± 0.28	1.45 ± 0.45
p		>0.20, NS	<0.01, S

Discussion

In our study, out of 40 IUD-wearing women with menorrhagia and with high normal TSH, 10 women (25%) were diagnosed as suffering from occult hypothyroidism by the TRH test. Thyroxin treatment stopped the menstrual disorders and the need for IUD removal. Our results are in accordance with those of Wilansky and Greisman [5]. In their study of 67 women with menorrhagia and normal TSH, 22% were found to have hypothyroidism by the TRH test.

The number of cases in our study is higher than that reported by Ingbar and Braverman [4], who found only 0.3–2.5% cases of occult hypothyroidism in a general female population.

There are several theories which try to explain why menorrhagia is so often present in IUD users. There are also several theories for the mechanisms by which hypothyroidism is associated with menorrhagia.

According to the hematological theory [6–8], menorrhagia can precede other signs of hypothyroidism. In hypothyroid patients, there is an increased vascular fragility, with coagulation disorders which can be successfully treated by thyroxin replacement.

As for the endocrinological mechanism of menorrhagia, in hypothyroidism there is a decrease in luteinizing hormone release followed by anovulation and lack of progesterone secretion [9]. In addition, a decrease in the binding capacity of the sex hormone binding globulin is found, which leads to increased estrogen, endometrial hyperplasia and bleeding [10].

According to recent research [11], hypothyroidism leads to decreased metabolic excretion of androstenedione (A) and estrone (E_1). In such a way, the endometrium is exposed to large amounts of estrogen, and reacts by hyperplasia and menorrhagia.

Whatever the mechanism, we conclude that every IUD-wearing woman suffering from menorrhagia may be suspected of having occult hypothyroidism. Should FT and TSH be within the normal range, a TRH test should be performed as the definitive test for an accurate diagnosis.

References

1. Population Reports; Intrauterine Devices. Series B, No. 4. 1982;10:101.
2. WHO Technical Report, Series 753. Mechanisms of action, safety and efficacy of IUD. WHO, Geneva. 1987;91.
3. Population Reports; Intrauterine Devices. Series B, No. 5. 1988;16:1.
4. Ingbar SH, Braverman LE. In: Werner SC, editor. The Thyroid. Philadelphia: JB Lippincott; 1986:626.
5. Wilanski DL, Greisman B. Early hypothyroidism in patients with menorrhagia. Am J Obstet Gynecol. 1989;160:673–5.
6. Egenberg BO. Influence of thyroid function on the blood clotting system. Scand J Clin Lab Invest. 1963;15:1–7.
7. Edson JR, Fecher DR, Doe RP. Law platelet adhesiveness and other hemostatic abnormalities in hypothyroidism. Ann Intern Med. 1975;82:342–5.
8. Hymes K, Blum M, Lackner H, Karpatkin S. Easy bruising, thrombocytopenia, and elevated immunoglobulin G in Graves' disease and Hashimoto's thyroidism. Ann Intern Med. 1981;94:27–30.
9. Distiller LA, Sagel J, Morley JE. Assessment of pituitary gonadotropin reserve using luteinizing hormone releasing hormone (LRH) in states of altered thyroid function. J Clin Endocrinol Metab. 1975;40:512–15.
10. Erfurth EM, Hedner J. Increased plasma gonadotropin levels in spontaneous hyperthyroidism reproduced by thyroxine but not by triiodothyronine administration to normal subjects. J Clin Endocrinol Metab. 1987;64:698–703.
11. Longcope C, Abend S, Braverman LE, Emerson CH. Androstenedione and estrone dynamics in hypothyroid women. J Clin Endocrinol Metab. 1990;70:903–7.

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Resumé

De récentes études ont permis d'observer et de mettre en évidence la forte incidence d'hypothyroïdie occulte chez les femmes ménorragiques. Afin de vérifier cette assertion, nous avons évalué l'activité fonctionnelle de la thyroïde chez les femmes portant un dispositif intra-utérin (DIU) et présentant un flux menstruel accru. Le groupe étudié comprenait 40 de ces femmes, âgées de 26 à 46 ans, souffrant de métrorragie. Le groupe témoin était composé de 38 femmes portant elles aussi un DIU, âgées de 24 à 44 ans, dont le flux menstruel n'avait pas augmenté de façon significative. La ménorragie a été définie comme étant un écoulement vaginal de sang anormalement abondant, durant 6 jours ou plus et/ou contenant une quantité significative de caillots.

On a mesuré les niveaux de thyroxine libre (FT) et de thyréostimuline hypophysaire (TSH). Les niveaux de FT, identiques dans les deux groupes, se situaient dans la gamme normale de 1,31 ± 0,28 ng/dl. Les taux de TSH étaient significativement plus élevés chez le groupe étudié que chez le groupe témoin, bien que restant dans la gamme normale, de 2,75 ± 2,06 par comparaison avec 1,45 ± 0,45 μU/ml, soit $p < 0{,}01$. Les 10 femmes dont les niveaux de TSH étaient les plus élevés ont été soumises au test à la thyréotrophine (TRH). Tous les résultats de ces tests étaient compatibles avec la présence d'une hypothyroïdie occulte. Un traitement à la thyroxine libre prescrit à ces femmes a entraîné une amélioration significative de leur flux menstruel dans les 3 mois suivant le début du traitement.

Nous en avons conclu que toute femme portant un DIU et souffrant de ménorragie peut présenter une hypothyroïdie occulte. Si les niveaux de FT et de TSH entrent dans les limites normales, il y aurait lieu de procéder à un test à la TRH pour établir un diagnostic définitif.

Resumen

En estudios realizados recientemente se observó y destacó la gran incidencia de hipotiroidismo oculto en mujeres menorrágicas. A fin de verificar esta aseveración, evaluamos la actividad funcional de la tiroides en mujeres que tenían colocado un dispositivo intrauterino (DIU) y que presentaban un flujo menstrual aumentado. El grupo estudiado comprendía 40 mujeres, de 26 a 46 años, que tenían DIU y sufrían

metrorragias. El grupo testigo constaba de 38 mujeres asimismo con DIU, de 24 a 44 años, cuyo flujo menstrual no había aumentado de modo significativo. La menorragia se definió como flujo vaginal de sangre excesivo, de 6 o más de duración y/o con cantidades significativas de coágulos.

Se midieron los niveles de tiroxina libre (FT) y de la hormona estimulante de la tiroides (TSH). Los niveles de FT eran idénticos en los dos grupos y dentro de la gama normal de 1,31 ± 0,28 ng/dl. Las proporciones de TSH eran significativamente superiores en el grupo de estudio que en el grupo testigo, si bien continuaban comprendidas dentro de la gama normal de 2,75 ± 2,06 en comparación con 1,45 ± 0,45 μU/ml, $p<0,01$. La prueba de hormona de descarga de tirotropina (TRH) se realizó en las 10 mujeres con los niveles más altos de TSH. Todos los resultados de estas pruebas eran compatibles con hipotiroidismo oculto. Esas mujeres fueron tratadas con L-tiroxina y su flujo menstrual mejoró significativamente dentro de los tres meses de tratamiento.

Llegamos a la conclusión de que cualquier mujer con DIU que sufre menorragia puede tener hipotiroidismo oculto. Si los niveles de FT y TSH están dentro de los límites normales, debe realizarse una prueba de TRH para tener un diagnóstico definitivo.