FLUORIDE, THYROID DISORDERS, AUTISM AND OTHER HEALTH CONCERNS

By Declan Waugh, Chartered Environmental Scientist

Hypothyroidism is an endocrine disorder. Located in the neck, the thyroid gland controls how quickly the body uses energy, produces proteins and how sensitive the body is to other hormones.

In 2006, the U.S. National Research Council's scientific committee for examining the toxicity of fluoride concluded that fluoride is an endocrine disruptor. Endocrine effects include altered thyroid function or increased goiter prevalence, impaired glucose tolerance, a decrease in age at menarche in girls in fluoridated towns, and disruptions in calcium metabolism. The scientific committee concluded that calcium deficiency induced or exacerbated by fluoride exposure may contribute to a variety of other health effects (NRC 2006)[1]. Furthermore, maternal sub-clinical hypothyroidism has been proposed as a cause of or contributor to development of autism in the child.[2,3]

Hypothyroidism may be either congenital (present at birth or be acquired (occur at any age after birth). One of the major impacts of hypothyroidism is reduced neuro-cognitive development in children.

The incidence of CHT was 1 case per 2296 live births in the Republic of Ireland (ROI) in the past decade with increasing numbers over recent years. [4] The Global mean incidence for Congenital hypothyroidism (CHT) is 1/3800 with a reported incidence of 1:3500 in Caucasian populations.

Ireland has the highest incidence of congenital hypothyroidism in the EU, and is the only EU Member States with a national legislative policy mandating artificially fluoridation of its drinking water supplies. **Ireland also has the lowest prevalence of breast feeding in the world and EU** with approximately 3% of infant's breast-fed at six months of age and less than 35% breast-fed from birth. The European average for breast-feeding of newborn infants from birth would be approximately 70%. **Consequently the vast majority of newborn babies in Ireland are exposed to fluoride from birth at dietary concentration above the recommended maximum daily tolerable intake level.**

Astonishingly, no health risk assessment has ever been undertaken in Ireland to examine the impact of artificial fluoridation on incidence of congenital hypothyroidism or any other health risks since the policy was introduced in the 1960's. Yet it is now known that for congenital hypothyroidism only a small number of cases is the condition inherited from the parents; for the majority the condition in infants develops independently, resulting in a failure of the infant body to produce a normal thyroid gland in the neck.[5]

---

[1] NRC (National Research Council). 2006. Fluoride in Drinking Water: A Scientific Review of EPA's Standards. [Available: http://www.nap.edu/catalog/11571.html]

[2] Román, G.C. 2007. Autism: Transient in utero hypothyroxinemia related to maternal flavonoid ingestion during pregnancy and to other environmental antithyroid agents. J. Neurological Sciences 262:15-26.

[3] Sullivan, K.M. 2009. Iodine deficiency as a cause of autism. J. Neurological Sciences 276:202.

[4] Clara McDonnell et al. Congenital hypothyroidism – A thirty year audit of the National Newborn Screening Programme in the Republic of Ireland, Endocrine Abstracts (2009) 23 P30

[5] HSE, Congenital hypothyroidism, Newborn screening, Information for Parents and Guardians.

In Europe, the overall incidence ratio for Congenital Hypothyroidism in the population is as follows:

Table 1: Incidence of Congenital hypothyroidism in EU Member States[6,7]

Austria	1/3,930	Italy	1/3,150
Belgium	1/3,750	The Netherlands	1/3,723
Czechoslovakia	1/6,037	Norway	1/3,069
Denmark	1/3,777	Portugal	1/3,139
Finland	1/3,969	Spain	1/3,216
France	1/4,132	Switzerland	1/3,913
Greece	1/3,314	UK	1/3,398
Hungary	1/5,632	Ireland	1/2,296

Note: Ireland is the only country in EU with a policy of artificial fluoridation. Ireland also has the highest incidence of Congenital hypothyroidism in the EU with an incidence rate at almost twice that recorded in other EU countries.

Interestingly is has further been documented by the Royal College of Surgeons Ireland, that *"Thyroid cancer has undergone a seismic epidemiology shift in the last 30 years. The incidence of thyroid cancer has risen 2.4 fold over this period".*[8] This period happens to coincide with the period when Ireland commenced artificial fluoridation of public water supplies.

Sub-clinical hypothyroidism (SCH), affects about one in six people over the age of 65 in Ireland and has been linked to various health problems, such as heart attacks and strokes, in later life.[9] The figure does not include the number of new cases of hypothyroidism diagnosed each year in the wider population. It is estimated that in the region of over 200,000 people in Ireland may suffer from hypothyroidism.

In a survey of 2,779 persons carried out in County Durham, England, hypothyroidism was detected in 1.9% of women and was overt in 1.4%. The prevalence in men was less than 0.1 percent[10]. Recent surveys indicate hypothyroidism to be more prevalent in elderly population, reaching as high as 20%[11]. A study of the Framingham population showed that 5.9% of the women and 2.4% of men above the age of sixty had serum TSH levels more than 10mU/L[12]. While in Ireland the prevalence of primary hypothyroidism has been stated as 8.6% in the women above the age of fifty years.[13]

[6] Congenital hypothyroidism – A thirty year audit of the National Newborn Screening Programme in the Republic of Ireland, Endocrine Abstracts (2009) 23 P30.
[7] Comparison of epidemiological data on congenital hypothyroidism in Europe with those of other parts in the world. Horm Res. 1992;38(5-6):230-5.
[8] O'Neill JP. Anaplastic thyroid cancer Irish epidemiology and novel chemotherapeutic strategies. [MD Thesis]. Dublin: Royal College of Surgeons in Ireland; 2009.
[9] The Irish Times - Tuesday, November 29, 2011
[10] Tunbridge WM, Evered DC, Hall R, Appleton D, Brewis M, Clark F, et al. The spectrum of thyroid disease in a community: the Whickham survey. Clin Endocrinology (Oxf) 1977 Dec;7(6):481-93.
[11] Sawin CT, Chopra D, Azizi F, Mannix JE, Bacharach P. The aging thyroid: increased prevalence of elevated serum thyrotropin levels in the elderly. JAMA 1979; 242(3): 247-50.
[12] Sawin CT, Castelli WP, Hershman JM, McNamara P, Bacharach P. The aging thyroid: Thyroid deficiency in the Framingham study. Arch Intern Med 1985;145(8):1386-88.
[13] Bonar BD, McColgan B, Smith DF, Darke C, Guttridge MG, Williams H, et al. Hypothyroidism and aging: the Rosses' survey. Thyroid 2000; 10(9): 821-7.

Worryingly International studies report a prevalence rate higher for children with Down's syndrome than that in the general population. An evaluation of reported studies would suggest a lifetime prevalence of approximately 25-30%. Ireland has the highest incidence of Down's syndrome in the EU. Many babies with Down's syndrome are unable to breast feed and are therefore exposed to fluoride from birth through consuming formula milk constituted from fluoridated tap water.

In addition, babies with Down's syndrome tend to bottle feed for much longer than normal infants further exposing them to the harmful effects of fluoride, which in itself may clearly explain the much higher incidence of thyroid disorders in children with Down's syndrome as well as other ailments.

Table 2. Common features of hypothyroidism and hyperthyroidism

Hypothyroidism	**Hyperthyroidism**
Tiredness Lethargy	Weight loss
Weight gain	Behavioural problems
Slowness	Irritable
Cold hands	Restlessness
Loss of memory	Tremor
Change in mood	Diarrhoea
Puffy face	Goitre
Dry, brittle hair	confusion
Dry, coarse skin	Heart palpitations
Constipation	heat intolerance
Abnormal periods	Abnormal periods

Source: (Korsager & Andersen, 1979; Quinn, 1980; Mani, 1988, Prasher, 1995).

Other conditions associated with thyroid problems

Premature puberty has been reported in both girls and boys. In girls it can present with breast development, pubic hair, vaginal secretion, menstruation, acceleration of growth and in boys with pubic hair, testis enlargement and height spurt. Barnes et al [14] studied the association of early puberty with juvenile hypothyroidism and concluded that long-standing thyroid failure induces increased TSH secretion, both indirectly (through the action of thyrotropin - releasing hormone) and directly (at the level of the pituitary) and this action on pituitary may induce subsequent premature sexual development. Hypothyroidism is also documented to be associated with weight gain, diabetes, musculoskeletal pain, cardiac disease, dementia, gastrointestional anolomies, cancer of the testis, hair loss and depression.

All of these conditions present substantial health concerns in the Republic of Ireland.

[14] Barnes, N.D., Hayles, A.B. & Ryan, J.R. (1973). Sexual maturation in juvenile hypothyroidism. *Mayo Clinic Proceedings*, 48, 849-856.