INTRODUCTION

Thyroid Cancer accounts for approximately 2% of neoplasms in males and 1-5% in females. Despite these low rates, it is the most common endocrine malignancy worldwide. The thyroid has been shown to be highly sensitive to the effects of ionising radiation. The nuclear accident at Chernobyl in 1986 led to the world’s largest release of radioactivity with nearly 2 x 10^18 Bq of iodine-131 released. Virtually all of Europe was exposed to iodine isotope fallout to at least some degree, although in the majority of areas this was significantly less than those closer to the reactor. Following Chernobyl there have been reports of 10-fold increases in the incidence of childhood thyroid cancer in the regions around the reactor. UK analyses have shown smaller yet significant increases in the incidence of thyroid cancer during the immediate post-Chernobyl period. In this study, our aim was to investigate trends in thyroid incidence in Scotland over the past 40 years using the latest available data.

METHODS

Thyroid cancer registrations were obtained from the Scottish Cancer Registry for the period of interest. They were grouped by age and sex. For the purpose of calculating incidence, definitions and histology types were taken from the International Classification of Disease Codes, Versions 7–10., i.e. ICD7 (194), ICD8 (193), ICD9 (193) and ICD10 (C73), and incidence rates for individual subtypes i.e. papillary, follicular, medullary, and anaplastic were obtained. All other remaining subtypes and unspecified registrations were grouped as other. Population data was obtained from the General Register Office for Scotland. For the ten-year periods observed, the populations showed little variation and the mid point of the populations was calculated and used to calculate age-standardised incidence rates.

RESULTS

Total incidence

Thyroid cancer was almost three times more common in females than males. Figure 1 shows that overall incidence increased over time, most notably in the 1997–2006 period. The overall mean thyroid incidence for males was 1.12 per 100,000 person-years (95% CI: 0.57-1.67) and 3.05 for females (95% CI:1.99-4.10). There was a statistically significant difference between the sexes (P=0.028). Figure 2 demonstrates the rising age-standardised incidence with increasing age for all the measured 10-year periods and there was no significant difference in the overall rates between these periods (P=0.55).

Histological Subtypes

Histological subtype analyses showed that in both sexes, there were significant increases in the incidence of papillary (male: P=0.0002; female: P=0.0001) and follicular (male: P=0.0012; female: P=0.0007) cancers. The other subtypes did not show significant changes. These results are demonstrated in figures 3 and 4.

DISCUSSION

We have shown evidence of an increasing incidence of thyroid cancer in Scotland and that it is more common in females. Evidence of an increasing rate of childhood thyroid cancer due to a Chernobyl effect are not shown in this study and this may be due to the low country radiation doses estimated from fallout in this region. We did demonstrate that the increased incidence of thyroid cancer has been associated with a change in histological distribution, with the greatest increase in the diagnosis of papillary carcinoma. These findings are consistent with reports from regions around Chernobyl of an increase in differentiated thyroid cancer.

Increasing incidence rates can be due to a true increase or can often reflect improvements in detection or reporting. The introduction of fine needle aspirates in the late 1980s together with ultrasound has improved detection and diagnosis of small tumours. Also, the introduction of new World Health Organization (WHO) histological criteria for definition of thyroid cancer may have affected the reporting of histological subtypes and affected distributions. In our study, we found a significant number of cases were registered as unspecified, accounting for the large numbers included in the ‘other’ group.

The introduction and implementation of national guidelines for recording, diagnosing and managing thyroid cancer will not only lead to improved patient care, but will also markedly improve the accuracy of data records. Future studies will therefore be able to recognise trends in the incidence of all cancers more accurately and with less confounding factors.

CONCLUSION

In Scotland, thyroid cancer incidence is increasing and is more common in females.

• This study adds more evidence to the epidemiological trends noticing an increase in differentiated thyroid cancer incidence over time, particularly in papillary and follicular cancers.

• The true impact of Chernobyl on thyroid cancer incidence in view of developments in detection of small tumours and classification changes is difficult to assess.

References

For more information on the study, please visit: [link]

Author: J.C. Fleming, K. Kapoor & I.M. Black
Affiliation: William Harvey Hospital, Ashford, UK
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