High incidence of medulloblastoma in Māori and Pacific populations in New Zealand

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ABSTRACT

In New Zealand from 1995–2010, the incidence of medulloblastoma at ages 1–19 years was significantly higher in Māori (relative risk 2.0) and in Pacific peoples (RR 2.1) than in New Zealand Europeans.

We report here on the incidence of medulloblastoma in ethnic groups in New Zealand, based on data from the New Zealand national cancer registry. This legally mandated registry has had complete national data since at least 1995. Ethnic background was considered as Māori, Pacific peoples or New Zealand European, excluding Asian and Middle Eastern/Latin American/African groups.

During the period 1995–2010 at ages 0–19 years, the annual incidence of medulloblastoma in Māori was 9.1 per million population (39 cases), and in Pacific populations was 9.7 per million (19 cases). These rates are significantly higher than in the New Zealand European population (4.5 per million, 60 cases), with relative risks of 2.0 (95% confidence limits 1.3 to 3.2) for Māori, and 2.1 (95% confidence limits 1.1 to 4.2) for Pacific groups, adjusted for age, year and gender (see Table 1). During this period 22% of the population aged 0–19 years was Māori, and 10% Pacific.

In each ethnic group, the incidence rates were higher in males than in females, but the ethnic differences were greater in females (see Table 1). In New Zealand Europeans, male rates were more than twice female rates, while in Pasifika male and

Table 1: Incidence of medulloblastoma, New Zealand, 1995-2010.

	NZ European	Māori	Pacific peoples
Total cases, age 0-19	60	39	19
Standardised rate per million per year*	4.54	9.11	9.73
RR and 95% CL	1 (referent)	2.0 (1.3 to 3.2)	2.1 (1.1 to 4.2)
Males, std rate	6.6	11.4	10.1
RR		1.7 (1.0 to 3.1)	1.5 (0.7 to 3.4)
Number of cases	44	25	10
Females, std rate	2.5	6.8	9.3
RR		2.7 (1.1 to 6.6)	3.8 (1.1 to 12.6)
Number of cases	16	14	9
Male to female ratio	2.8: 1	1.8:1	1.1:1

* Rates directly standardised for age, year, gender, to the WHO world standard population.
RR = relative risk CL = confidence limits.

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female rates were almost equal; although these comparisons are based on small numbers. Overall, incidence was higher at ages 5–9 than 0–4 or 10–14 years, but the age patterns were similar in each ethnic group. There was no significant change in incidence over time, overall or in any ethnic group.

An excess of medulloblastoma in Māori has been previously shown in cancer registry data from 1948–1988, but cancer registration was incomplete at that time.[1] An excess in Māori was also noted in an Auckland hospital series in 1995–2004.[2]

An increased incidence of medulloblastoma in non-European ethnic groups has not been shown elsewhere, although the international literature is limited. In the US the incidence of medulloblastoma was lower in black and in Hispanic groups than in the white population, and it was slightly and non-significantly lower in the 'Asian/Pacific Islander' group.[3] The rates in New Zealand Māori and Pasifika are higher than any reported in ethnic groups in the US. The overall rate in this US report was 5.2 per million, based on ages 0–14, 2007–11 and standardised to the US population; the equivalent New Zealand rate was the same, based on 52 cases.

We have no explanation for this empiric, but statistically robust, finding. Further clinical and genetic characterisation of these tumours may be informative. We are not aware of any data on subtypes or other factors related to ethnicity in New Zealand patients. The lower male:female ratio in Māori and Pasifika could be relevant, as among the four major subtypes of medulloblastoma, the wingless (WNT) subtype shows a female preponderance, and the sonic hedgehog (SHH) subtype shows about equal sex distribution, while other main groups show male excesses.[4]

Competing interests:
Nil.

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