

Incidence of Childhood Cancer in Trinidad and Tobago

C Bodkyn¹, S Lalchandani²

ABSTRACT

Background: The Government of Trinidad and Tobago is in the process of developing a comprehensive National Oncology Programme. Regarding Paediatric Oncology, it is necessary to characterize this population to adequately direct its development. This report describes the incidence of childhood cancer in Trinidad and Tobago.

Procedure: The data were extracted from the National Cancer Registry of Trinidad and Tobago and the Eric Williams Medical Sciences Complex. Malignancies were coded with the International Classification of Childhood Cancer, 3rd edition. Incidence rates were calculated for the period 2001–2006, age 0–14 years and by county.

Results: The crude incidence rate of childhood cancer was 1.9 per 100 000 patient years (pyrs). One hundred and forty-five cases were reviewed for the six-year period with an incidence rate of 7.5 per 100 000 pyrs. The highest incidence was in children < 5 years: 14 per 100 000 pyrs for males and 11.4 per 100 000 pyrs for females.

Leukaemias and central nervous system tumours formed the majority of the cancers (58.6%), however nephroblastoma was more common than neuroblastoma especially in females < 5 years: 2.7 per 100 000 pyrs compared with 1.2 per 100 000 pyrs for neuroblastoma. The incidence of all childhood cancers did not vary across counties, however, there was a higher incidence of leukaemia in three counties.

Conclusion: The results provide insight into the incidence of childhood cancer in Trinidad and Tobago. It is lower than in developed countries. There are some unique findings in the incidence of nephroblastoma in girls less than five years of age and the relatively higher incidence of leukaemia in three counties. Further analysis is required in these areas.

Keywords: Childhood cancer, incidence, Trinidad and Tobago

Incidencia del Cáncer Infantil en Trinidad y Tobago

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RESUMEN

Antecedentes: El Gobierno de Trinidad y Tobago está en proceso de desarrollar un Programa Nacional de Oncología integral. Con respecto a la Oncología Pediátrica, es necesario caracterizar esta población adecuadamente para dirigir su desarrollo. Este informe describe la incidencia de cáncer infantil en Trinidad y Tobago.

Procedimiento: Los datos se extrajeron del Registro Nacional del Cáncer en Trinidad y Tobago y el Complejo Eric Williams para las Ciencias Médicas. Los tumores malignos fueron codificados con la Clasificación Internacional de Cáncer Infantil, 3^{era} edición. Se calcularon las tasas de incidencia para el periodo 2001–2006; en la edad 0–14 años y por condado.

Resultados: La tasa bruta de incidencia de cáncer infantil fue de 1.9 por 100 000 años-paciente. Se estudiaron ciento cuarenta y cinco casos por un periodo de seis años con una tasa de incidencia de 7.5 por 100 000 años-paciente. La incidencia más alta se encontró en los niños < 5 años: 14 por 100 000

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años-paciente para los varones y 11.4 por 100 000 años-paciente para las hembras. Las leucemias y los tumores del sistema nervioso central constituyeron la mayor parte de los cánceres (58.6%). Sin embargo, el nefroblastoma fue más común que el neuroblastoma, especialmente en las hembras < 5 años: 2.7 por 100 000 años-paciente en comparación con 1.2 por 100 000 años-paciente del neuroblastoma. La incidencia de todos los cánceres infantiles no varió en los condados. Sin embargo, hubo una incidencia mayor de leucemia en tres condados.

Conclusión: *Los resultados dan una visión de la incidencia de cáncer infantil en Trinidad y Tobago. Esta es más baja que en los países desarrollados. Hallazgos de interés único fueron la incidencia de nefroblastomas en niñas menores de cinco años de edad y la incidencia relativamente más alta de leucemia en tres condados. Se requiere análisis ulterior en estas áreas.*

Palabras claves: Incidencia, cáncer infantil, Trinidad y Tobago

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INTRODUCTION

In Trinidad and Tobago, the incidence of cancer given as ASR (Age-standardized rate world population) per 100 000 for all sites except C44 non-melanotic skin malignancy was 149 for males and 130 for females. Paediatric cancers, in the 0–14-year age group, account for less than 2% of these cases (1). The public expenditure per capita has been increased over recent years from US\$1165.70 in 1990 to US\$3369.80 in 2005. Public expenditure on health as a percentage of GDP was 2.5% in 2005 (2).

The Government of Trinidad and Tobago is committed to the development of a comprehensive National Oncology Programme which centres on a multidisciplinary team approach to cancer care. The paediatric oncology service was formalized in 2001 with the appointment of a Paediatric Oncologist at the Eric Williams Medical Sciences Complex. The service is the only treatment centre for childhood cancers and serves Trinidad and Tobago and adjacent Caribbean territories such as Guyana, Grenada, St Lucia and Antigua. This report characterizes the incidence of childhood cancer in Trinidad and Tobago. It is the first population based incidence data on childhood cancers in the English-speaking Caribbean. Other published data reported the incidence in Puerto Rico and Cuba (3, 4).

SUBJECTS AND METHOD

The Republic of Trinidad and Tobago is situated northwest of Venezuela 10 – 11 degrees north of the equator and 60 – 61 degrees west longitude. Trinidad has an area of 4828 square kilometers and Tobago 300 square kilometers. The official language is English. The population is 1.3 million of which 49.9% are male and 50.1% female, with 62% aged under 35 years of age and 24.7% under 15 years of age. The population is mixed resulting from years of migration from Africa, India, Europe and Asia. The ethnic composition is 39.6% of African decent, 40.3% of East Indian decent, 18.4% of Mixed decent, 0.6% Caucasian and 0.4% Chinese (1).

Cancer incidence data were collated for all childhood malignancies in Trinidad and Tobago, for the period 2001 to

2006, using (1) the Dr Elizabeth Quamina Cancer Registry: The National Cancer Registry of Trinidad and Tobago (2) the Paediatric Oncology service at the Eric Williams Medical Sciences Complex (EWMSC) which is the National treatment centre for all cases and (3) the Central Statistical Office (CSO) on all cancer related deaths. The National Cancer Registry, established in 1994, is a population based cancer registry and actively abstracts cancer data from all healthcare facilities, both public and private, treating cancer patients. The data collected is coded using the International Classification of Diseases for Oncology, third edition (ICDO-3) and stored using a password protected CANREG database. The paediatric oncology service at EWMSC is the only paediatric oncology centre on the island, therefore the data captured from both these sources reflected the majority of the cases presenting in the population. Reviewing cancer deaths reported by the central statistical office of Trinidad and Tobago, further strengthened the data.

Once collated, the data were then recoded based on the International Classification of Childhood Cancer, Third edition [ICCC-3] (5). Although the paediatric oncology service treated children from other Caribbean territories during the period 2001–2006, these were not included in the report. Incidence rates per 100 000 pyrs were calculated for all groups of malignancy for the period 2001–2006, patient – age 0 – 14 years and by county. The population data for the counties, Mayaro/Nariva and St Andrew/St David were grouped by the CSO. Therefore, the incidences for these counties were calculated using the total number of cases in both counties. Mean difference in incidence was assessed by One Sample Test using SPSS version 12.

RESULTS

The population of Trinidad and Tobago is 1.3 million. For the period 2001 – 2006, there were 145 new cases of childhood cancers recorded. Of these, 82 (56.6%) cases were male and 63 (43.4%) cases were female. The crude incidence rate of childhood cancer was 1.9 per 100 000 pyrs. One hundred and forty-five cases were reviewed for the six-

year period in the 0–14-year population with an incidence rate of 7.5 per 100 000 pyrs. The highest incidence was in children < 5 years: 14 per 100 000 pyrs for males and 11.4 per 100 000 pyrs for females. As expected, leukaemias/lymphoma (40%) and central nervous system tumours (18.6%) form the majority of the cancers (58.6%), however nephroblastoma (ICCC-3: VI) was more common than neuroblastoma (ICCC-3: IV) especially in females < 5 years: 2.7 per 100 000 pyrs compared with 1.2 per 100 000 pyrs for neuroblastoma. The incidence of all childhood cancers did not vary across counties, however, there was a higher incidence of leukaemia in three counties. By county, the average incidence of childhood cancers was 7.96 per 100 000 pyrs (95% confidence interval 7.09, 8.83; $p < 0.001$, One-Sample Test). The incidence of leukaemia was higher in the counties of St Andrew, Victoria and Caroni (mean incidence 2.52 per 100 000 pyrs (95% CI 1.34, 3.70); $p = 0.004$, One Sample Test)

DISCUSSION

This is the first comprehensive population-based report on the incidence of childhood cancer in Trinidad and Tobago

County	Population	Number of cases	Incidence
Victoria	58 646	32	9.09
Caroni	49 277	26	8.79
Tobago	14 555	7	8.49
Mayaro/*Nariva	9 816	5	8.02
St Andrew/*St David	18 960	9	7.9
St George	135 488	54	6.64
St Patrick	34 934	13	6.2

* No reported cases in St David and 1 case reported in Nariva

Incidence of leukaemia by county

County	Incidence
St Andrew/St David	3.5
Victoria	3.1
Caroni	3
St George	1.6
St Patrick	1.4

* No reported cases in St David, Tobago, Mayaro and Nariva

ICCC-3 Group Cancers	Number of cases						All
	Incidence per 100 000 pyrs						
	0–4 yrs		5–9 yrs		10–14 yrs		
	Male	Female	Male	Female	Male	Female	
I – Leukaemia	13	7	6	6	6	3	41
	4.9	2.7	1.9	1.9	1.5	0.8	2.1
II – Lymphoma	2	–	2	–	7	6	17
	0.8	0	0.6	0	1.8	1.6	0.9
III – CNS tumours	6	5	5	6	5	–	27
	2.3	2	1.6	1.9	1.3	0	1.4
IV – Neuroblastoma	5	3	1	1	1	–	11
	1.9	1.2	0.3	0.3	0.3	0	0.6
V – Retinoblastoma	4	1	–	–	–	–	5
	1.5	0.4	0	0	0	0	0.3
VI – Renal tumours	4	7	1	2	1	1	16
	1.5	2.7	0.3	0.6	0.3	0.3	0.8
VII – Hepatic tumours	–	1	1	–	–	1	3
	0	0.4	0.3	0	0	0.3	0.16
VIII – Malignant bone tumours	–	–	1	3	2	2	8
	0	0	0.3	1	0.5	0.5	0.4
IX – Soft tissue tumours	1	3	2	1	–	1	8
	0.4	1.2	0.6	0.3	0	0.3	0.4
X – Germ cell tumours	2	2	1	–	–	–	5
	0.8	0.8	0.3	0	0	0	0.3
XI – Other malignant epithelial neoplasms	–	–	–	–	3	–	3
	0	0	0	0	0.8	0	0.15
XII – Other unspecified malignant neoplasms	–	–	–	1	–	–	1
	0	0	0	0.3	0	0	0.05
All cancers	37	29	20	20	25	14	145
	14	11.4	6.2	6.5	6.3	3.7	7.5

Cancer incidence by county, all cancers 0–14 years

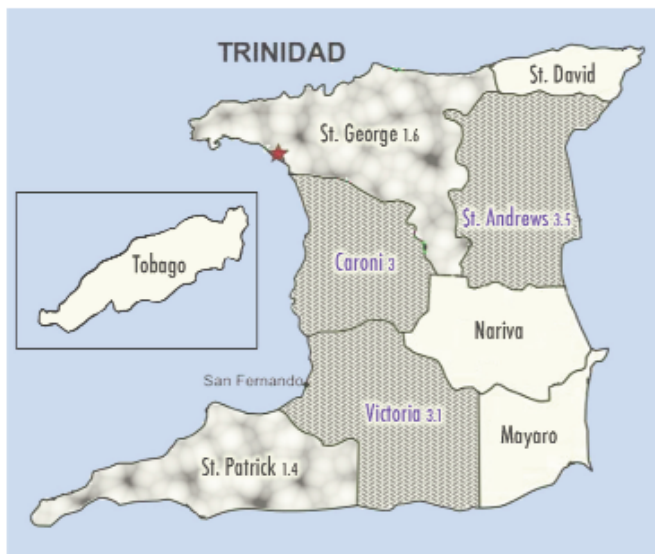


Figure: Cancer incidence by county

and the English-speaking Caribbean. The incidence was low in comparison to published international data. The relative frequency of occurrence of childhood cancer was comparable to international frequency data with some exceptions, an increased incidence of nephroblastoma in girls less than five years and nephroblastoma being commoner than neuroblastoma.

The incidence of childhood cancer was 7.5 per 100 000 pyrs. This was lower compared with the USA-SEER and United Kingdom incidence of 15 and 14.4 per 100 000 pyrs respectively (6). It is however recognized in these countries that the incidence for cancers are lower in the Black population (6, 7). Trinidad and Tobago with its multi-ethnic population made it difficult to make direct comparisons with the Black populations in other countries. The use of the three sources to capture the data optimized the likelihood that the majority of cases were represented in these data. It is therefore unlikely that the difference in incidence observed in the report can be attributed to missing cases. However, there may be a small number of cases that may not have come to the attention of these sources if a child was diagnosed and went directly to an overseas international centre and is now a survivor or died at that centre.

As expected, the incidence was highest in children less than 5 years and haematological malignancies along with central nervous system tumours formed the majority of the cancers. However, nephroblastoma was more common than neuroblastoma with a particularly high incidence in girls less than 5 years, equal to that for leukaemia. This was an unusual finding and will certainly need further investigation to ascertain whether genetic factors play an important role.

The incidence rate for all childhood malignancies across counties was very similar ranging from 9.09 to 6.2 per

100 000 pyrs. Calculating the exact incidence for the counties of Mayaro and St Andrew was limited by the lack of separate population data for these counties. There were no recorded cases of childhood cancer in St David for this period. It will be important, in further studies, to look closely at the environs of this county compared to that of the other counties, in an attempt to identify possible environmental causes. The data were further analysed looking at the incidence of leukaemia by county. In this analysis, three counties (Victoria, Caroni and St Andrew) emerged with a significantly higher incidence of leukaemia, than the other counties. In these counties, the majority of children are of East Indian decent and agriculture is the main industry. This will require further investigation to determine if environmental factors or ethnicity are contributing to the higher incidence of leukaemia observed in these area.

CONCLUSION

In conclusion, the results provide a good insight into the incidence of childhood cancer in Trinidad and Tobago. The incidence is lower than that reported in developed countries. There are some unique findings in the incidence of nephroblastoma in girls less than 5 years of age and the relatively high incidence of leukaemia in three counties. In both these areas more detailed analysis is required. Further evaluation of environmental and genetic factors is required to clarify these findings.

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