

ENHANCING INFORMATION ON STAGE AT DIAGNOSIS FOR CHILDHOOD CANCER IN AFRICA

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Abstract

Background/Purpose Stage at diagnosis is an important metric in treatment and prognosis of cancer, and also in planning and evaluation of cancer control. In sub-Saharan Africa (SSA), for the latter, the only data source is the population-based cancer registry (PBCR). For childhood cancers, the “Toronto Staging Guidelines” have been developed to facilitate abstraction of stage by cancer registry personnel. Although the feasibility of staging using this system has been shown, there is limited information on the accuracy of staging. **Methods** A panel of case records of 6 common childhood cancers was established. 51 cancer registrars from 20 SSA countries staged these records, using Tier 1 of the Toronto guidelines. The stage that they assigned was compared with that decided by two expert clinicians. **Results** The registrars assigned the correct stage for 53-83% of cases (71% overall), with the lowest values for acute lymphocytic leukaemia (ALL), retinoblastoma and non Hodgkin lymphoma (NHL), and the highest for osteosarcoma (81%) and Wilms tumour (83%). For ALL and NHL, many unstageable cases were mis-staged, probably due to confusion over the rules for dealing with missing data; for the cases with adequate information, accuracy was 72-73%. Some confusion was observed over the precise definition of three stage levels of retinoblastomas. **Conclusions** A single training in staging resulted in an accuracy, for solid tumours, that was not much inferior to what has been observed in high income settings. Nevertheless, some lessons were learned on how to improve both the guidelines, and the training course.

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Figure 1. Summary of the Tier 1 stages for 6 cancers of childhood: Childhood Cancer Staging Rules for Population Based Registries (version 2) [Aitken et al, 2021]

Fig.1a. Acute lymphoblastic leukaemia	
CNS-	- No clinical signs of CNS involvement and - No blasts in CSF
CNS+	- Clinical signs of CNS involvement* or - Blasts in CSF
* Clinical signs of CNS involvement are defined as - Radiologic evidence of intracranial, intradural mass. - Cranial nerve palsy (e.g. facial weakness, ptosis), brain/eye involvement of hypothalamic syndrome.	
Fig.1b. non-Hodgkin lymphoma	
Limited	No involvement of CNS <u>and</u> no involvement of bone marrow
Advanced	Involvement of CNS and / or bone marrow*
* BM involvement: Morphologic evidence of $\geq 5\%$ blasts or lymphoma cells by BM aspiration or biopsy. CNS is considered involved in case of: - Any CNS tumour mass (identified by imaging techniques [i.e., CT, MRI]) - Cranial nerve palsy that cannot be explained by extradural lesions - Blasts morphologically identified in CSF	
Fig.1c. Wilms tumour	
Localised	Tumour confined to the area of origin including abdominal lymph nodes
Metastatic	Distant metastases present at diagnosis
Fig.1d. Rhabdomyosarcoma	
Localised	Tumour confined to the area of origin including abdominal lymph nodes
Metastatic	Distant metastases present
Fig.1e. Malignant bone tumours	
Localised	Tumour confined to the area of origin including abdominal lymph nodes
Metastatic	Distant metastases present
Fig.1f. Retinoblastoma	
Localised	Intraocular
Regional	Orbital extension or regional lymph nodes
Metastatic	Distant metastases present

a. Acute lymphoid leukaemia				
GOLD	Answers (R)			Total
	CNS-	CNS+	X	
CNS-	180	50	16	246
CNS+	4	46	3	53
X	45	81	45	171
Total	229	177	64	470
c. Osteosarcoma				
GOLD	Answers (R)			Total
	L	M	X	
L	245	31	12	288
M	39	132	5	176
Total	284	163	17	464
e. Wilms tumour				
GOLD	Answers (R)			Total
	L	M	X	
L	207	42	2	251
M	33	173	1	207
Total	240	215	3	458
		Overstaged, relative to G		

b. NHL					
GOLD	Answers (R)			Total	
	L	A	X		
L	148	23	27	198	
A	46	152	13	211	
X	34	12	39	85	
Total	228	187	79	494	
d. Retinoblastoma					
GOLD	Answers (R)				Total
	L	R	M	X	
L	208	50	10	4	272
R	19	42	18	3	82
M	37	18	71	3	129
Total	264	110	99	10	483
f. Rhabdomyosarcoma					
GOLD	Answers (R)			Total	
	L	M	X		
L	210	30	6	246	
M	52	146	5	203	
Total	262	176	11	449	
		Understaged, relative to G			

Fig 3. Staging cases with missing information

a. Acute lymphocytic leukaemia

Case	Involvement of CNS (clinical signs)	Blasts in CSF	STAGE
1	-	?	X
2	-	-	CNS-
3	+	?	CNS+
4	+	-	CNS+
5	-	+	CNS+
6	+	+	CNS+

+ Evidence of presence - Absent ? No information

b. Non-Hodgkin lymphoma

Case	Bone Marrow	CNS	STAGE
1	?	?	X
2	-	?	X
3	?	-	X
4	-	-	L
5	+	?	A
6	?	+	A
7	+	-	A
8	-	+	A
9	+	+	A

+ Evidence of presence - Absent ? No information

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