

The distribution and treatment outcomes of paediatric cancer patients referred for radiotherapy in low and middle-income countries –The Uganda experience

Introduction

Cancer is one of the major causes of death for paediatrics patients worldwide and the recorded incidences tend to increase with time. Low and middle income countries have younger populations and therefore the proportion of children with cancer is significant. Most of these children die from the disease because of the numerous social economic factors including poverty, few diagnostic health facilities, limited access to education / information, scattered rural populations, scarcity of oncology experts, limited treatment facilities, etc. In this study we followed the American Academy of Paediatrics that recommends people under paediatric care to be up-to the age of 21 years; categorised into: Infancy (birth-2), Childhood (2–12) and Adolescence (12–21) years of age. Paediatric tumors include a wide range of tumors and the burden of these tumors in our resource-challenged center, is not well documented. The main objective of this study was to evaluate the distribution and treatment outcomes of paediatric tumors, and to propose strategies that could improve outcomes.

Methodology

To evaluate the distribution and treatment outcomes of Paediatric cancers referred for Radiotherapy, we retrospectively reviewed all the patient's records/files referred to our department, from January 2015 to December 2018. The study involved patients aged 21 years and below with confirmed histological diagnosis referred to the radiotherapy department. Information retrieved from patients records/files included age (categorised into infancy, childhood and adolescence), sex, histological diagnosis, stage, pre-treatment received, ECOG status, treatment intent, radiation dosages (fractionation/total-dose) and follow-up at discharge, 3-months, 6-months and 1-year.

Results

Between January 2015 and December 2018, a total of 4178 new cancer patients were referred for radiotherapy. Of these, 304 (7.3%) were paediatrics. The Male:Female ratios was 1.2:1.0. The percentage distributions into Infancy, Childhood and Adolescence were 9.2%, 53.6% and 37.2% respectively. The three most common tumours of Infancy were Wilms (53.6%), Retinoblastoma (17.9%) and Sarcomas (14.3%); Childhood tumours were Wilms (34.4%), Sarcomas (21.5%) and Lymphomas (18.4%), while Adolescents were Sarcomas (25.7%), NPC (23.9%) and Lymphomas (18.4%). Overall, the four most common cancers were Wilms (23.4%), Sarcomas (22.4%), Lymphomas (18.2%) and NPC (11.6%). Figure 1 show a summarised distribution pattern of the cancers referred for radiotherapy. Overall 65.8% of these patients presented in ECOG status 0–1 and 34.2% in ECOG 2-3. A precise staging was deficient in many files, but only 12% presented with stages I-II, the rest (88%) presented with stages III-IV diseases. Overall 61.3% were planned and treated with radical intention, the rest were treated palliatively. Wilms tumours which were dominant presented mainly with stage III disease, post-surgery/chemotherapy and treated radically with 1.8 Gy daily doses for 6 fractions. The prescribed radical doses ranged from 36.0 Gy for lymphomas to 70.0Gy in extremity soft-tissue sarcomas. In 65% of the palliative treatments, single doses of 6.0Gy, 8.0Gy and 10.0Gy were prescribed; other palliative prescriptions included 20.0Gy/5-fractions and 30 Gy/10-fractions. Because a large number presented relatively with advanced diseases and in poor ECOG status, 67.7% completed the prescribed doses. For those who completed their treatments, their conditions at discharge were 52.7% in ECOG 0-1, 25.8.7% in ECOG 2-3 and 21.5% in ECOG 4. After 6 months and one year of follow-ups, 47.7% and 56.8% respectively have been confirmed dead or lost to follow-up.

Discussion and Conclusion

Paediatric tumours comprised of a wide-range of cancers, accounting for ≈8% of all referrals. Paediatric tumours deserve more attention from policy makers. The results show that most of our patients (≈90%) present with locally advanced diseases and nearly 40% are treated palliatively which impedes on treatment outcomes. Precise diagnosis including pathology and imaging procedures to identify the stage - the foundation on which all subsequent management decisions are based is not readily available in most rural areas. One radiotherapy facility with long waiting times also resulted in some patients giving-up or failing to complete treatment. Logistical problems like transport/finances, cultural beliefs and alternative medicines, etc caused delayed referrals and presentations.

Possible strategies we propose that could result in improved outcomes include:

- i) Increase public awareness on cancer presentations and symptoms –to improve on early detection, which is the most plausible drivers for better cancer outcomes.
- ii) Better-trained health professionals in rural/regional referral hospitals to minimise delays in diagnosis and starting treatment
- iii) Strengthened cancer services in regional/referral hospitals in collaboration with international organisations and other stake-holders.
- iv) Need for comprehensive national paediatric cancer strategies to improve early diagnosis and treatment access to majority of children with cancer
- v) Proper co-ordination of various treatments –to minimise delay in radiotherapy delivery
- vi) Building dedicated regional research capacity / evidence-based cancer treatments
- vii) Access to cancer treatments - essential requirements that need much bigger budget, staff and mandate to enhance the logistical complexities of acquiring and maintaining radiotherapy services.
- viii) Paediatrics are more radio-sensitive than adults. Precautionary and quality measures are required when it comes to radiotherapy delivery.

Country or Int. Organization

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