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Full length article

A survey of immunization practices in children with cancer in India[☆]



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ABSTRACT

Context: Children with cancer, when on treatment and immunosuppressed, are at risk of infection from live vaccines and do not mount an adequate protective response to inactivated vaccines. Hence, immunizing them during and after treatment requires special considerations.

Aim: We wanted to assess the current practice of clinicians caring for children with cancer in India regarding immunisation in these children during and after treatment.

Methods and material: Clinicians from India attending the various pediatric cancer conferences in 2013 were invited to complete a questionnaire.

Statistical analysis used: Data was analysed using software SPSS version 16 and GraphPad InStat version 3.05. Conventional statistics were used for analysis. Variation in practice was assessed by Fisher's exact test.

Results: Responses from 37 institutes (response rate 74%) in 21 cities across India showed that there is variable practice of immunising children with cancer. There were areas of homogeneity (discontinuing all live vaccines during treatment and recommending immunisation six months after end of treatment) and heterogeneity (continuation of inactivated vaccines and use of the hepatitis B vaccine during treatment). The variation was seen mainly among clinicians from public and private centres with no significant variation by annual caseload or duration of practice of the responding clinician. Variations were also observed in relation to sibling and parent vaccination.

Conclusions: There is variation in the immunization practices in India in relation to children with cancer. Development and dissemination of immunisation guidelines specific to India would be useful in standardizing practice.

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1. Introduction

Immunisation for vaccine preventable diseases are important in children with cancer as it can reduce non-cancer related morbidity and mortality in these children [1]. Many developed countries have formulated guidelines for immunising children with cancer during as well as after the completion of treatment, in line with their national immunisation schedules [2,3]. However such guidelines

from the developing countries are scarce [4]. In the absence of any such dedicated guidelines in India the immunisation received by children with cancer remains uncertain due to controversies and differences in opinion regarding the vaccines as well as their timing in these children. Till recently, the Indian Academy of Pediatrics (IAP) Guidebook of Immunisation did not provide any detailed guidance for immunising these children. The 2014 Guidebook of Immunisation, however, for the first time addresses the issue of immunisation in children with cancer as part of a chapter dealing with vaccination in the immunocompromised children [5].

The current study (done before the introduction of the new IAP guidelines) aims to assess the current practice of clinicians caring for children with cancer in India regarding immunisation in these children during and after treatment. We also wanted to determine immunisation practices for siblings and parents of the children with cancer during their treatment.

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2. Methods

Clinicians attending the Indian Pediatric Oncology Initiative meeting in August 2013 were invited to complete a self-administered questionnaire; participation being fully voluntary. Based on their responses and feedback the survey questionnaire was modified and subsequently administered to clinicians attending the Indian Pediatric Oncology Group meeting, Pediatric section of the Indian Cancer Congress all in New Delhi, India in 2013 and Indian clinicians at the annual conference of the International Society of Pediatric Oncology held in Hong Kong, China in 2013. One response was sought per centre. For the purpose of this survey the questions related to children with cancer who have received chemotherapy and not those undergoing haematopoietic stem cell transplantation.

Data was extracted from the questionnaire entered and analysed using software SPSS version 16 (Statistical Package for Social Sciences, SPSS, Inc., Chicago IL) and GraphPad InStat version 3.05 for Windows 95, GraphPad Software, San Diego California USA, www.graphpad.com. Conventional statistics were used for analysis. Variation in practice by annual caseload (<100 and >100 new childhood cancer patients), sector (public and private) and duration of practice (<10 years and >10 years) was assessed by Fisher's exact test.

3. Results

Of the 50 institutes contacted, responses from 37 (74%) representing 21 cities in India were obtained of which 49% were in the public sector and 46% had an annual caseload of more than 100 new childhood cancer patients. The characteristics of respondents and their institutes are displayed in [Table 1](#).

The responses to the questionnaire of the entire study group ($n = 37$) are presented in [Table 2](#). Most respondents believed that live vaccines were contraindicated during treatment. 49% advised inactivated but not live vaccines and 43% advised no vaccine during cancer treatment to the child. Clinicians working in private sector were more likely to stop all vaccinations during treatment (76%) as opposed to those in the public sector (27%) who would like to continue inactivated vaccines for majority of their patients ($p = 0.004$). 67% recommend hepatitis B vaccine (83% public hospitals, 53% private hospitals, $p = 0.08$) and 32% annual influenza vaccine (25% public hospitals, 42% private hospitals, $p = 0.48$) to the child undergoing treatment. On exposure to chicken pox, use of acyclovir was the main prophylactic strategy.

The majority (73%) recommended immunisation 6 months after completion of treatment with no significant difference between the two groups in relation to either schedule or timing of re-immunisation. More than half of the respondents (57%) would modify the immunisation schedule of siblings, mainly by omitting the oral polio vaccine or replacing it by the injectable version. Additional vaccines for siblings and parents were recommended by a minority of respondents and included influenza, varicella and hepatitis B vaccine. No differences of practice in relation to any of the questions asked were evident among oncologists when grouped according to the number of years in oncology practice or by annual caseload.

4. Discussion

Children with cancer remain susceptible to a host of infections both during and after their treatment due to various disease/treatment induced immune dysfunctions [1,6]. Many international agencies have promulgated protocols for immunising these children and most of these come from the developed countries [2,3,7,8]. Until recently there was no evidence based Indian guideline on immunisation of children with cancer, and practitioners in India had to rely on international guidelines and/or practice based on scientific principles. The current study was therefore planned to identify the practice of clinicians regarding immunisation of children with cancer during treatment and following completion of therapy.

Respondents were approached during conferences/meetings with paper questionnaire as anticipated response to other modes of survey was low [9]. Only one consultant was approached from any given institute. Our study group comprised of oncologists with varied duration of experiences and were from almost all major regions of the country as well as both public and private institutes. We recognise that surveys are limited in scope and that stated practice may not always be true. Nevertheless, surveys are a convenient tool and have been used elsewhere to determine practices related to immunising children with childhood cancer [10–12].

Our study shows that practice of immunising children being diagnosed with cancer in India varies. This observation of variable practice is similar to that made in UK and Australia [10,11]. A repeat survey in UK done after the introduction of Royal College of Pediatrics and Child Health guidelines on immunisation in children with cancer [3] showed high level of stated compliance with guidelines and hence consistency in practice [12]. This would suggest that availability of guidelines has the potential to deliver uniform immunisation services to these children.

Our survey also identified areas of homogeneity and heterogeneity in practice, particularly between clinicians from public and private centres. There was no significant variation by annual caseload or duration of practice of the responding clinician. Discontinuing all live vaccines during treatment and recommending immunisation more than six months after end of treatment were the main areas of homogeneity. Heterogeneity was observed in the continuation of inactivated vaccines during cancer treatment and use of the hepatitis B vaccine during treatment. Historically, high rates of hepatitis B have been seen in children with cancer after immunosuppressive treatment, which has attributed to viral transmission through transfusion of blood products as well as horizontal transmission through other routes [13,14]. Although our survey did not directly explore the reasons for variation in practice, one can hypothesize that the children coming for treatment at public hospitals would be less likely to be immunised against hepatitis B and the screening practices of blood donors may not be as stringent [15]. This may have a bearing on the practices of

Table 1
Characteristics of respondents and their institutes ($n = 37$).

Duration of practice	<5 years	4 (10.8%)
	6–10 years	11 (29.7%)
	11–15 years	13 (35.1%)
	16–20 years	3 (8.1%)
	>20 years	6 (16.2%)
Setting of practice	Public	18 (48.6%)
	Private	19 (51.3%)
Location of practice	North India	14 (37.8%)
	South India	12 (32.4%)
	East India	3 (8.1%)
	West India	8 (21.6%)
New patients seen (numbers/year)	<25	2 (5.4%)
	25–50	4 (10.8%)
	51–100	13 (35.1%)
	101–200	8 (21.6%)
	>200	9 (24.3%)
	No response	1 (2.7%)

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