

Commentary

Pediatric musculoskeletal radiologist in India – Challenges and opportunities

Ganesh Hegde¹, Sahana Giliyaru², Pooja Hegde³, Rajesh Botchu¹

¹Department of Musculoskeletal Radiology, Royal Orthopedic Hospital, Birmingham, United Kingdom, ²Department of Pediatrics, Rajajeswari Medical College and Hospital, Kambipura, Karnataka, India, ³Department of Radiology, Royal Lancaster Infirmary, Lancaster, United Kingdom.



*Corresponding author:

Rajesh Botchu,
Department of Musculoskeletal
Radiology, Royal Orthopedic
Hospital, Northfield,
Birmingham, United Kingdom.

drbrajesh@yahoo.com

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ABSTRACT

Pediatric musculoskeletal (MSK) radiology is a relatively under developed superspeciality in India. It encompasses many different entities such as bone tumors, congenital bone dysplasias, endocrine and metabolic bone disorders, and trauma. We conducted a survey of Indian pediatricians and radiologists to assess to ascertain their view regarding the role of pediatric MSK radiologist. In this article, we discuss the challenges, opportunities, and importance of pediatric MSK radiologist in India.

Keywords: Pediatric, Musculoskeletal, Radiologist, India

INTRODUCTION

Bone tumors are rare neoplasms, some of which are common in 1st and 2nd decades and can be associated with morbidity and even mortality. The spectrum of bone tumors in children is different from adults. Benign bone tumors are more common than malignant in the pediatric age group.^[1] Furthermore, anatomical variants and musculoskeletal (MSK) injuries specific to the pediatric population may cause confusions and misdiagnosis to the inexperienced eye. A thorough understanding of these is essential to arrive at a definitive diagnosis and reduce the morbidity and mortality.^[2] Besides the difficulties and diagnostic dilemma in imaging of pediatric bone tumors, interventions in children are a challenge of its own. Due to the complexities of imaging and interventions in the pediatric population, specialist pediatric centers with MSK services are well established in the developed world. Similar centers in India are a rarity. We performed a survey of the pediatricians and radiologists in India to ascertain their views regarding the role of pediatric MSK radiologist with emphasis on bone tumors in India.

MATERIAL AND METHODS

An anonymous questionnaire was sent via an online web platform-survey monkey to pediatricians and radiologists in India. The questions included whether there was a need for a pediatric MSK radiologist, number of bone tumors seen per year, the level of confidence in diagnosis, and what one would do when they come across such a case. The survey also included further questions as to whether bone biopsy was done by them and included some cases regarding approach of biopsy and management. The responses obtained were analyzed.

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RESULTS

One hundred responses were obtained. Approximately half of the doctors who participated in the survey were pediatricians (48), and the rest were radiologists (52). About 60% were working in teaching hospitals and 30% in private health care. About 60% of the respondents felt strongly that there is a role for pediatric MSK radiologist in India. The number of bone tumors seen was relatively high, with a quarter of the respondents seeing more than 10 in a year and 57% encountering <5 cases. About 40% were unsure of the diagnoses with only a minority (5%) being very confident. A third of those who responded would have referred to a regional bone tumour center, and another third sent the report to the referrer. Around 10% would have performed the biopsy. Half of the respondents would have discussed the case with referrer or orthopedic oncology surgeon before performing a biopsy and 20% through the bone tumor multidisciplinary team meeting.

DISCUSSION

Bone sarcomas are rare tumors with osteosarcoma and Ewing's sarcoma being the most common. It is important to note that majority of bone lesions, especially in children are benign. Imaging plays a key role in diagnosing these tumors and is vital to make an accurate diagnosis. Early diagnosis is crucial to reduce mortality and morbidity. However, making a confident diagnosis of bone tumors is easier said than done. Not only can these tumors themselves have varied appearances, but there are also many MSK injuries and developmental variants that can mimic tumors. Avoiding unnecessary biopsy and treatment of these benign conditions is as important as early diagnosis of malignant neoplasms.

Pediatric MSK imaging is highly specialized field, which requires knowledge of the appearances of growing MSK system, normal variants, and specific pathologies that can be seen in this cohort. Radiographs are the mainstay in the evaluation of suspected bone tumors. However, if lesions appear aggressive, further, imaging with magnetic resonance imaging (MRI) and computed tomography (CT) is usually indicated, acquiring the images (CT/MRI) in pediatric age group itself could be challenging sometimes with the requirement of sedation or general anesthesia. Performing image-guided procedures under sedation and general anesthetic are not uncommon and coordination with pediatric anesthetic team, radiologist and radiographers are crucial. Establishing a suitable infrastructure is essential with features such as MRI compatible anesthesia machine and ventilators. Pediatric MSK ultrasound is a relatively quick, cheap, and portable, patient friendly modality, that allows static and dynamic examination and is integral for MSK interventions.^[3] An

interventional radiologist is an integral component of most radiology services. Pediatric interventional radiology services are superspecialized, which is available in very few centers in India. These include soft tissue and bone biopsy, radiofrequency ablation, joint and tendon injections, and sclerotherapy with proven efficiency to reduce morbidity and probably mortality.

India is a young country with a large, growing pediatric population with approximately 43% of the population being <25 years old.^[4] Pediatric radiology in India is still in its infancy.^[5] In comparison to other subspecialties, such as pediatric neurology, pediatric nephrology, pediatric cardiology, pediatric radiology, and pediatric MSK radiology, in particular, are still in its incipient stages. In most centers in India, general radiologists or specialist MSK radiologists report pediatric MSK radiology studies. There is also a wide variation in the way that the bone tumors are managed once diagnosed radiologically. There are no clear guidelines and recommendations. The clinical decision is usually dependent on individual clinician's preferences/available resources rather than a multi-disciplinary team approach.

There is also relatively low demand for pediatric MSK radiology among trainees. Inadequate training opportunities, lack of suitable infrastructure, and limited job opportunities later on due to lack of specialized centers are some of the factors for this. Dedicated pediatric MSK radiology modules and training opportunities would address the deficiency of pediatric radiology fellowships in India. Travelling fellowships to universities and conferences can help to encourage trainees to take up pediatric MSK radiology.

Establishment of specialized centers for pediatric MSK pathologies, including bone tumors seems to be the way forward. These centers if established at regional or state level will prove extremely beneficial by providing high quality care for pediatric MSK pathologies. Multidisciplinary team approach with involvement of the clinicians, radiologists, and pathologists in decision making would result in better clinical outcomes. Involving these centers with radiology and pediatric organizations to formulate standard operating procedures, referral pathway, guidelines, and management recommendations would enable uniformity of services across the country. With recent advances such as teleradiology and web-based consultations, these centers can be easily connected to district hospitals or even with hospitals in remote areas to standardize the imaging protocols and reporting, to provide guidance in the management and follow-up of some of the pediatric MSK conditions. In person and online, interactive and teaching sessions can be used to spread the awareness regarding the standardized approaches. Innovative methods such

as conducting multidisciplinary meetings on web-based platforms and allowing health care workers to observe these meetings may help not only to raise the awareness but also to generate interest among health-care professionals. Apart from providing high quality clinical services, these centers also have the potential to be developed as centers of excellence for teaching and research. Facilities available in these centers may be utilized for training medical staff by planning fellowship programs or certification courses after discussion with appropriate health authorities.

This study has a few limitations. First, our sample size was small. Second, the focus of this survey has been on pediatric MSK tumors. However, these centers, with available infrastructure and expertise of the staff, would be in a position to cater to all the other aspects of pediatric MSK disorders such as congenital bone dysplasias, endocrine and metabolic bone disorders, and trauma.

CONCLUSION

Our survey and this article highlight the need and importance of pediatric MSK radiologist and provide an insight and possible solutions to increase its profile in India. Specialist centers not only help to provide high quality clinical care but also pave the way for advances in imaging and treatment of pediatric MSK conditions as well as contribute to research and training opportunities in this field. The intension of this survey is to ignite a thought; further efforts and discussions are needed about establishing such centers.

Declaration of patient consent

Patient's consent not required as there are no patients in this study.

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Conflicts of interest

Dr. Rajesh Botchu is on the Advisory Board of this journal. He does not have any competing interest.

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