ABSTRACT

Background: Early recognition of deep seated infections (osteomyelitis and abscesses) in the pediatric population may be difficult, given nonspecific symptoms and signs, but remains crucial in the management. There is increasing emphasis on ionizing radiation dose reduction, making whole-body MRI (WBMRI) with short TI inversion recovery (STIR) the advanced imaging modality of choice over bone scintigraphy/CT-scan.

OBJECTIVES

1. To describe the characteristics of patients who had WBMRI
2. To determine what percentage of patients had evidence of uni- focal osteomyelitis (OM), multifocal OM, or another type of infection (i.e. abscess) on the WBMRI
3. To describe the causative organisms isolated
4. To describe complications related to sedation used for WBMRI

METHODS

A retrospective chart review of pediatric patients, <19 years, at Palmetto Health, Columbia, SC who had WBMRI with infectious indications during 9/2011 to 12/2013 was performed. The aims of this research were to describe complications related to sedation/contrast, to determine what portion of patients had new evidence of deep seated infections and to obtain initial evidence for effectiveness of WBMRI.

RESULTS

- Clinical characteristics of the 20 patients are summarized in Table 1. WBMRI findings included unifocal OM, multifocal OM, and other deep seated infections (Figures 1 and 2).
- WBMRI found an average of 1-4 areas of OM in 12 patients and up to 8 other locations of deep seated infections in 15 patients. 11/20 had post WBMRI surgical intervention of debriement/drainage.
- Gram-positive cocci were isolated from 10/17 patients with positive blood/tissue cultures. Of those, 6 were MRSA.

CONCLUSION

Utilized as an early imaging modality in pediatric patients with persistent bacteremia/fevers, WBMRI commonly facilitated timely definitive interventions while sparing the patient exposure to ionizing radiation. WBMRI with STIR was safe and is likely to be cost effective.

INTRODUCTION

• Osteomyelitis is often a complication of bacteremia and has been linked to developing permanent disability and fatalities if unrecognized in the pediatric population. Early recognition of infection and rapid initiation of therapy is important to avoid the sequelae.

• Bone 99mTc scintigraphy, CT scan, and a ray are all routinely used to diagnose multiple sites of bone infection, with bone 99mTc scintigraphy currently being the standard of care in locating early deep seated infections in patients who have failed antimicrobial therapy. These modalities expose patients to high amounts of ionizing radiation which potentially increases cancer risk.

• Whole Body MRI (WBMRI), which has no radiation exposure, has been found to be effective in the detection of inflammatory arthritis, metastatic lesions and asymptomatic bone inflammatory changes that were not seen on radiographs/bone scan.

• However the risks associated with sedation during MRI imaging such as hypoxia and failed sedation remain a concern.

REFERENCES

5. Scalei ER et al. Managing radiation risk in the evaluation of pediatric trauma patients. Semin Pediatr Surg. 2010

CONCLUSIONS

- WBMRI as an early imaging modality in pediatric patients with persistent bacteremia/fevers, commonly facilitated timely definitive interventions while sparing the patient exposure to ionizing radiation
- WBMRI with STIR was safe and is likely to be cost effective
- Data collection is ongoing