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Original Article

Neurological Manifestations of Community Acquired Staphylococcus Aureus Infection- A Case Series

Priya Logia[1], Vijayakumar .M[1], Renuka M.K.*[2]

[1]Senior Resident, Department of Critical Care Medicine, Sri Ramachandra Institute of Higher Education & Research.
[2] Professor and Head, Department of Critical Care Medicine, Sri Ramachandra Institute of Higher Education & Research

ABSTRACT

Background: Community acquired Staphylococcus Aureus causing neurological manifestations is rare. Very few reports document presentations and outcomes of this disease. We present, a series of 4 patients with neurological manifestations of spontaneous community acquired Staphylococcal Aureus admitted to an adult intensive care unit (ICU)over one year period. Patterns of community acquired Staphylococcal Aureus related neurological manifestations, from different regions are needed to draft evidence based management guidelines.

Objectives: To document clinical, laboratory and radiological findings in a cohort of community acquired Staphylococcal Aureus patients hospitalised with neurological manifestations and compare their presentation and outcomes with previously published cases available.

Study design: Clinical, laboratory, demographic information and outcomes were collected from patients with confirmed CNS infections of community acquired Staphylococcal Aureus treated in an ICU, in a tertiary care hospital, from September 2021- August 2022.

Results: The case series had a male predominance(75%) and the mean age was 61.3 yrs. All 4 patients were diabetics.75% had an epidural abscess but none had features of infective endocarditis. All patients were positive for MRSA in blood and pus. They were treated with parenteral Vancomycin and surgical decompression whenever indicated. Out of the 4 patients 2 improved and were discharged, 1 patient was transferred to another centre and 1 patient died.

Conclusion: Awareness of neurological manifestations of community acquired Staphylococcal Aureus should allow its early recognition and institution of appropriate treatment. Reports on community acquired Staphylococcal Aureus, from different regions will help in formulating more evidence-based guidelines, for optimum evaluation and care of such patients. Our data contributes towards this goal.

Key Words: CA- MRSA, Neurological manifestation, ICU

***Corresponding Author**
Renuka M.K.*
Professor and Head, Department of Critical Care Medicine, Sri Ramachandra Institute of Higher Education & Research

INTRODUCTION

Community acquired Staphylococcus Aureus causing neurological manifestations due to spontaneous/hematogenous spread is rare. We present a series of 4 patients with neurological manifestation of spontaneous community acquired staphylococcal Aureusin the time period September 2021-August2022.

Case presentation:

Case 1: MRSA meningitis, folliculitis and panophthalmitis

56 year old Diabetic presented with fever, backache, pustular skin lesions (Fig.1a) and blurring of vision andquadriparesis. MRI of brain and spine was normal, irregular nodular lesion in retina. Biopsy skinlesionsand blood cultures- MRSA treated with Vancomycin.TEE ruled out infective endocarditis. Patient developed altered sensorium. CSF analysis consistent with meningitis with high counts, proteins and lactate, CSF culture- negative since patient was onvancomycin. Patient developed progressive loss of vision both eyes with hypopyon.(Fig. 1b).Hypopyon cultures showed Pseudomonas and Achromobacter Xylosidans – Ceftazidime wasstarted. B scan of R eye showed subtenon fluid collection with vitreous hemorrhage. Vitectomyandintravitreal injection of vancomycin, ceftazidime and dexamethasonewas done. Repeat blood cultures showed persistent MRSA. Vancomycin trough levels checked and dose modified.microbiological clearance attained. Patient's neurological status improved. Vancomycin was continued for 4 weeks.

Case 2: MRSA Epidural abscess

66 year Diabetic, post Right BK amputation 3months prior to admission and MRSA infection in blood and pus treated with vancomycin and linezolid from outside hospital.Duration of therapy not known.

Now readmitted with persistent neck pain, drop in GCS, slurring of speech, quadriparesis and hypotension.MRIspine and brain- cervical C5-C6 and lumbar lytic lesions,epidural collection and infective granulation in Rt high parietal region(Fig. 2a,2b).Blood c/s – MRSA treated with Vancomycin. Cervical decompression,anterior corpectomyand instrumentation done. Patient was intubated during the procedure was tracheostomised later due to reduced muscle power. Epiduralpuscultures showed MRSA. TEE- ruled out Infective endocarditis. Repeat blood cultures showed persistent MRSA clearance. Vancomycin trough levels checked and dose modified. Patients GCS and quadriparesis improved minimally. Weaned to T-piece.

But in the next few days patient developed secondary infection, thrombocytopeniaand bleeding from the operative site. Repeat MRI showed collection in the cervical region with dorsal and lumbar extension. Planned for re-exploration. Meanwhile patient developed DVT had sudden cardiac arrest probably due to pulmonary embolism.

Case 3: MRSA meningitis, epidural abscess and spondylodiscitis

65Yrwith history of diabetic foot and osteomyelitis of metatarsals for which amputation with MRSA in blood and pus cultures treated with vancomycin and linezolid a year back.

Now patient was admitted with complaints of backache, dysuria and breathing difficulty. Blood cultures -MRSA treated with vancomycin. patient developed altered sensorium , CSF analysis consistent with bacterial meningitis-MRSA. MRI brain-normal. Neurosurgery opinion obtained. TTE- no vegetations. GCS improved. In view of persistent backache, MRI spine done showed L4-L5 epidural abscess and spondylodiscitis(Fig. 3). Patient was planned for posterior spinal decompression, instrumentation fixation and biopsy. But patient had NSTEMI significantly elevated cardiac biomarkers and surgery was deferred. Patient was discharged and shifted to another hospital at request.

Case 4: MSSA Meningitis, Epidural abscess andspondylodiscitis

58yr female,Diabeticwith a past history of ray amputationof right toe7 years earlier. 15 days backunderwent spinal decompression and instrumentation for with Infective spondylodiscitisL3-C1. Blood cultures -MSSA, CR-Klebsiellapneumonia treated with colistin and teicoplaninfor an inadequate duration and discharged.

She was readmitted now with Fever, hypoglycemic seizure, altered sensorium and hypotension. MRI brain- T2 flair hyperintensities in bilateral periventricular region and deep white matter region of bilateral frontal and parietal lobe.MRI spine- Interval decrease in collection L1-S2 paraspinal muscles.(Fig. 4).Blood cultures-MSSA. Patient was treatedwithcloxacillin.

DISCUSSION

40% of Staphylococcal meningitis are nosocomial, 20% due to endocarditis or paraspinal infection[1,2&3]. It is important to locate the source and seeding organs, appropriate therapy for adequate duration[2, 4]. Surveillance cultures are required to check for microbiological clearance[5,6&7].In non-responders high dose vancomycin, double dose to increase the CNS concentration or continuous infusion of vancomycin 50-60mg/kg/day in patients with normal renal function[8,9&10].Rifampicin and linezolid have good CNS penetration, can be administered with vancomycin[10,11].

CONCLUSION

Staphylococcal infections causing neurological manifestation have poor outcome, high mortality and prolonged hospital stay.Prompt diagnosis, treatment and eradication by completion of the duration of therapy will help improving outcome.

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Figures:

Figure 1a: Patient **1**- Folliculitis

Figure 1b: Patient **1**-Hypopyon

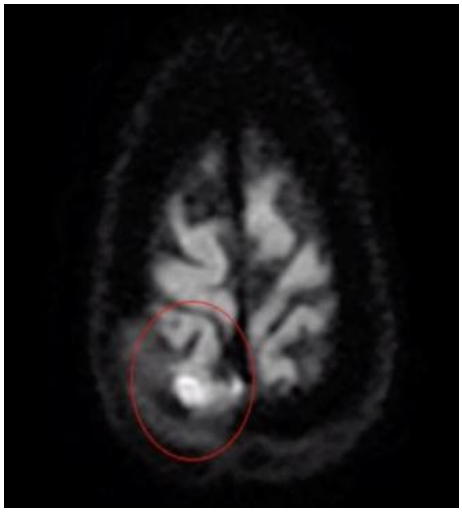

Figure 2a: Patient **2**-MRI brain showing infective granulation in Rtparietalregion

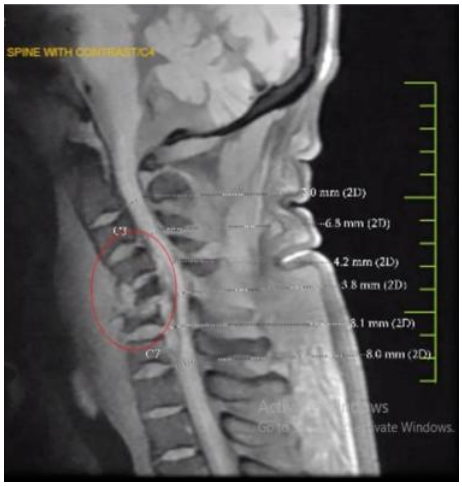

Figure 2b: Patient **2**-MRIspine showing cervical C5-C6 epidural abscess, vertebral osteomyelitis

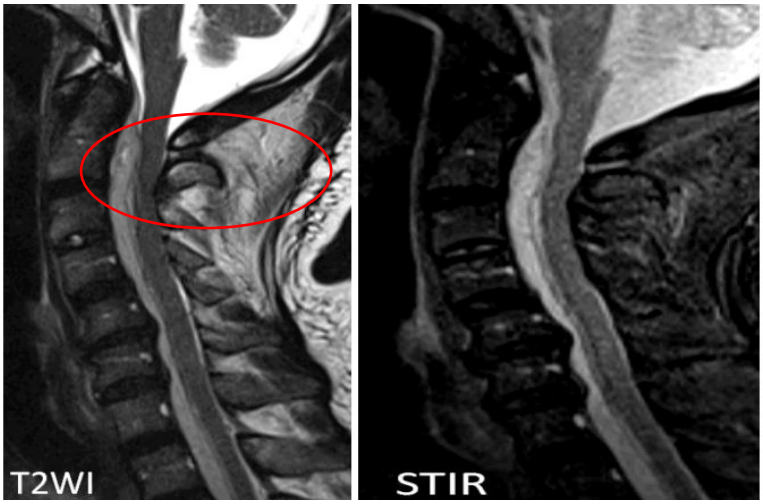

Figure 3: Patient **3**- MRI spine showingmeningitis &epidural abscess

Figure 4: Patient **4** -MRI spine showingcollection L1-S2 paraspinal,extradural& epidural space