1.Case report

2.A case of staphylococcal septicemia with tropical pyomyositis and pneumonia associated with Guillain-Barré Syndrome

3.Staphylococcal sepsis and GBS

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10 .Abstract : Staphylococcal infections are commonly encountered in paediatric population and range from mild skin infections to septicaemia and deep seated localization. Tropical pyomyositis is characterized by deep suppurative collections in muscle planes and causative organism most often is staphylococcal aureus. We report clinical course of a child who belongs to subtropical area of North India who developed multiple deep pyogenous collections complicated with staphylococcal septicaemia followed by transient lower limb weakness consistent with Guillain-Barré Syndrome.

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Keywords: Hydrosyringomyelia , Hyporeflexia , MRSA(Methicillin resistant Staph aureus)

Case report:

A 9 years old female child presented with complaints of fever of 2 days, bodyaches and pain abdomen. on admission temp 101F with generalized abdominal tenderness was present. Investigations- Hb-9.8, TLC- 5000/cumm, platelets- 78000/cumm, dengue, MP, Typhidot were negative.USG Abd was normal. Child was admitted as case of viral fever and started on symptomatic treatment. At 48 hrs of admission child developed high grade fever with chills upto 104F, pain both lower limbs and inability to walk. There was poorly localised tenderness involving both calfs and both thighs. USG both thighs and legs failed to show any focus. On repeat investigations there was rise in TLC and raised CRP levels, so Inj ceftriaxone was started. At 72 hrs of admission child developed respiratory distress with fast breathing and chest retractions, low oxygen saturation at room air. On examination there was reduced air entry on Rt side of chest. Rest of the systemic exam was normal. CXR revealed RMZ RLZ consolidation. On CT chest there were septic emboli and pneumatoceles. Antibiotics were modified to include Inj Tiecoplanin and in addition Tab Azithromycin and HCQ were also added and PCR for COVID19 was sent. Child needed CPAP for 3 days and remained on oxygen for another 4 days. Child remained febrile with raised CRP, ESR upto 59, rising TLC to 15400/cumm with neutrophillia and toxic granules on PBS. Serum biochemistry and liver enzymes were normal but rise in S. LDH upto 634 was noted. Weil felix and COVID serology came negative. Tab HCQ and Azithro were stopped. Blood culture turned positive for Staph aureus (MRSA type)which was sensitive to teicoplanin and hence same antibiotics were continued. There was fall in Hb levels to 6.0gm% with positive stool for occult blood which needed PRBC transfusion. Respiratory distress settled but high grade fever was persisting with daily spikes and positive CRP and raised ESR. On D10 of admission we noted diffuse swelling Rt leg mimicking cellulitis and tenderness in both thighs. On USG pus pockets were noted and MRI T2W1 and STIR images confirmed multifocal pyogenous collections in the inter and intramuscular regions of anterior and medial compartments of both thighs. Drainage of about 8ml and 5ml of pus was done from Rt and Lt thighs respectively in OT. But child remained febrile and further developed another pus pocket in left calf which also needed drainage. Antibiotics were changed to Inj Vancomycin. However fever persisted for another 4 days which needed prolonged antibiotic therapy with Inj Vancomycin at doses of 60mg/kg/day. On D 15 of admission Weakness was noted in both lower limbs with hyporeflexia. To rule out GBS a LP was performed and on CSF study proteins were raised to 54 mg/dl without any rise in cell counts. NCV study could not be performed due to unavailability. MRI dorsal spine was also done as a workup for lower limb weakness which was a normal study

except for incidentally detected hydrosyringomelia involving D6 toD8. IVIG 2gm/kg over 4 days was administered. There was no progression of the weakness and weakness improved slowly over next 6 days.Child was discharged on D 22 on oral antibiotics for another 8 days with total duration of antibiotic therapy of 4 weeks. on followup child remained asymptomatic. Neurosurgical consultation was taken and syringomyelia dorsal spine was an incidental finding in this case.

Pic 1. CT Chest showing : multiple air filled cavities and soft tissue densities in B/L lung fields .Also seen are few peripheral wedge shaped air space opacities suggestive of septic emboli B/L Lung fields

Pic 2 MRI both thighs i)Top Left axial STIR image ii) Rest all coronal STIR images showing multiple Hyperintense pyogenous collections

Pic 3 MRI Spine saggital T2W view showing hydrosyringomyelia D6-D8spine. This was an incidental finding in our case.

DISCUSSION:

Tropical pyomyositis is suppurative collection within skeletal muscles and manifest as single or multiple pockets of abscess formation. It is frequently encountered in tropical countries but cases from temperate zones are also reported.[1] Staphylococcal aureus is most common etiological agent.[2] There are many virulence factors which enables this organism to colonize, evade immune response, cause tissue injury and disseminate. In establishing infection, S. aureus expresses surface proteins that mediate adherence and impair local defences, while during latter part of the pathology secreted exotoxins disrupt epithelial barriers and immune cell function responses, thereby facilitating tissue invasion.[3] S. aureus disease spectrum varies as a result of i) local suppuration like skin and soft tissue infections such as impetigo, ecthyma, folliculitis, ii) systemic dissemination such as sepsis, pneumonia, pyomyositis, osteomyelitis, endocarditis, iii) effects of toxin production such as food poisning, toxic shock syndrome, scalded skin syndrome. Community- associated MRSA is commonly associated with recurrence of such infections and has precedence for lower extremities and buttock. Staph pneumonia may be hematogenous or secondary after a viral illness. It often causes a necrotising pneumonitis which may be secondary to septic emboli. Staph pneumonia can also be localized or diffuse bronchopneumonia or even a lobar disease.[4] Recently much attention has been given to panton-valentine leucocydin(PVL), a virulence factor protein which combines with phospholipids in the leucocyte cell membrane leading to increased permeability and cell death. S. aureus strains producing PVL are associated with more severe and invasive disease mainly in young immunocompetent individuals.[4,5] our

patient was young immunocompetent without any risk factors belongs to Samba district of Jammu region which is a Temperate zone. Patient had CA MRSA who presented with fever and bodyaches without localizing signs symptoms and within 48 hrs had respiratory distress requiring CPAP and subsequently developed sepsis and latter part of illness complicated with multiple deep tissue abscess. MRSA infections are now becoming endemic in most parts of the world including developed nations and recently PVL producing MRSA strains are being reported globally[6] we could not test PVL positivity in S. aureus isolates.

Another interest of our case is to highlight possible association of Staph sepsis with Guillain-Barré Syndrome. Though NCV study was not available at our centre at Jammu but clinical picture and CSF study favoured the transient weakness as GBS only which responded well to IVIg therapy. Guillain-Barré Syndrome is an autoimmune postinfectious polyneuropathy which usually follows GI or respiratory illnesses, or rarely vaccination. Cases have been reported following infections like lyme disease, cytomegalovirus and H. influenzae.The proposed mechanism is autoimmune neural injury to myelin gangliosides following molecular mimickery.[7] There has been case reports of GBS following staphylococcal endocarditis and following pyomyositis in adult population.[8,9] Syndrome of transient weakness involving lower exterimities with hyporeflexia and CSF study suggestive of GBS following staph sepsis in paediatric population is not been reported till date as per literature search done by us. By this case report we propose that GBS may follow staphylococcal sepsis and even after the septic focus was eliminated. Hence we must be watchful for such a complication following staph pyomyositis which is an uncommon scenario.

REFERENCES:

1.Grose C. Feigin RD, Cherry JD, Demmler GJ, Kaplan SL. Pyomyositis and bacterial myositis, Textbook of pediatric infectious diseases, 2004 5th ed.PhiladelphiaSaunders(pg. 737-41)[Google Scholar]

2. Levin MJ, Gardner P, Waldvogel F. Tropical pyomyositis: an unusual infection due to Staphylococcus aureus, N Engl J Med, 1971, vol. 24 (pg. 196-8) Google Scholar Cross ref

3. Dayan GH, Mohamed N, Scully IL, et al. Staphylococcus aureus: the current state of disease, pathophysiology and strategies for prevention. Expert Rev Vaccines. 2016;11:1373

4 James K. Todd. staphylococcus, Nelson Textbook of pediatrics,19th ed. ch 174(pg 905)

5 Carrillo-Marquez MA, Hulten KG, Hammerman W, LamberthL, Mason EO, Kaplan SL. Staphylococcus aureus Pneumonia inChildren in the Era of Community-acquired Methicillin-resistance at Texas Children's Hospital. Pediatr Infect Dis J. 2011;30(7):545-50.

6 Glaser P., Martins-Simões P., Villain A., Barbier M., Tristan A., Bouchier C., Ma L., Bes M., Laurent F., Guillemot D., et al. Demography and Intercontinental Spread of the USA300 Community-Acquired Methicillin-Resistant Staphylococcus aureus Lineage. MBio. 2016;7 doi: 10.1128/mBio.02183-15. [PMC free article] [PubMed] [CrossRef] [Google Scholar]

7 Harvey B. Sarnat. Guillain-Barré Syndrome, Nelson Textbook of pediatrics,20th ed. ch 616(pg3010)

8 . Baravelli M, Rossi A, Picozzi A, Gavazzi A, Imperiale D, Dario P, et al. A case of Guillain-Barre syndrome following Staphylococcus aureus endocarditis. Int J Cardiol. 2007;114:E53–5. [PubMed] [Google Scholar]

9 Amita Narendra Bhargava, Subhakaran Khichar, Gaurav Mansukhlal Kasundra, and Bharat S. K. Bhushan Staphylococcus aureus tropical pyomyositis induced Guillain-Barré syndrome.Ann Indian Acad Neurol. 2014 Jan-Mar; 17(1): 139.doi: 10.4103/0972-2327.128594 [PubMed] [Google Scholar]