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THE STREPTOCOCCUS PLURANIMALIUM

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Introduction:

Streptococcus pluranimalium (S. pluranimalium) is unusual streptococcal species, which is rarely identified from humans. Limited cases are reported from this new species; the present study is the first case report from India indicating infection with S. pluranimalium causing empyema.

Streptococcus pluranimalium was first isolated in 1999 from a case of bovine mastitis, but has been isolated from a number of other animals like chickens, goats, cats, canaries, sheep, Nile tilapia, a pheasant, and an alpaca. S. pluranimalium can be cultured from various mucosal surfaces (e.g. cervix, vagina, lung, tonsils) and from milk of infected dairy animals. [1,4] S. pluranimalium has some animal reservoirs because the source of this species are milk and other infectious secretions of animals and transmitted to human in the form of zoonosis.[5,6] According to previous experience with rare case reports, vancomycin, aminoglycosides, and cephalosporins are the drugs of choice for S pluranimalium infection.[7]

The aim of present study was to report the first case of human empyema due to S pluranimalium in India.

Table 1: Reported cases of Streptococcus pluranimalium infection in humans between 2012 and 2017 [8-13]

Age	Disease	Source	Specimen	Prognosis
N/A	Febrile neutropenia	Not identified	Blood PCR	n/a
53	Septic arthritis	Not identified	Pus, Blood	died
17	Subdural empyema	Sinusitis, Dental infection	pus	recovered
N/A	Periodontitis, Bacteremia	Periodontitis	Blood c/s	n/a
N/A	Endocarditis	IV drug user	Blood c/s	died
N/A	Endocarditis	Animal	Blood c/s	Recovered
N/A	TAVI associated endocarditis	Dental extraction	Blood c/s	died

Case presentation:

A 59 years old male from pune, known case of Diabetes type 2 and hypertension since 10 years, admitted in ICU of poona hospital and research Centre, pune, India with complaints of dyspnea on exertion, dry cough, fever and decreased appetite since 7 days.

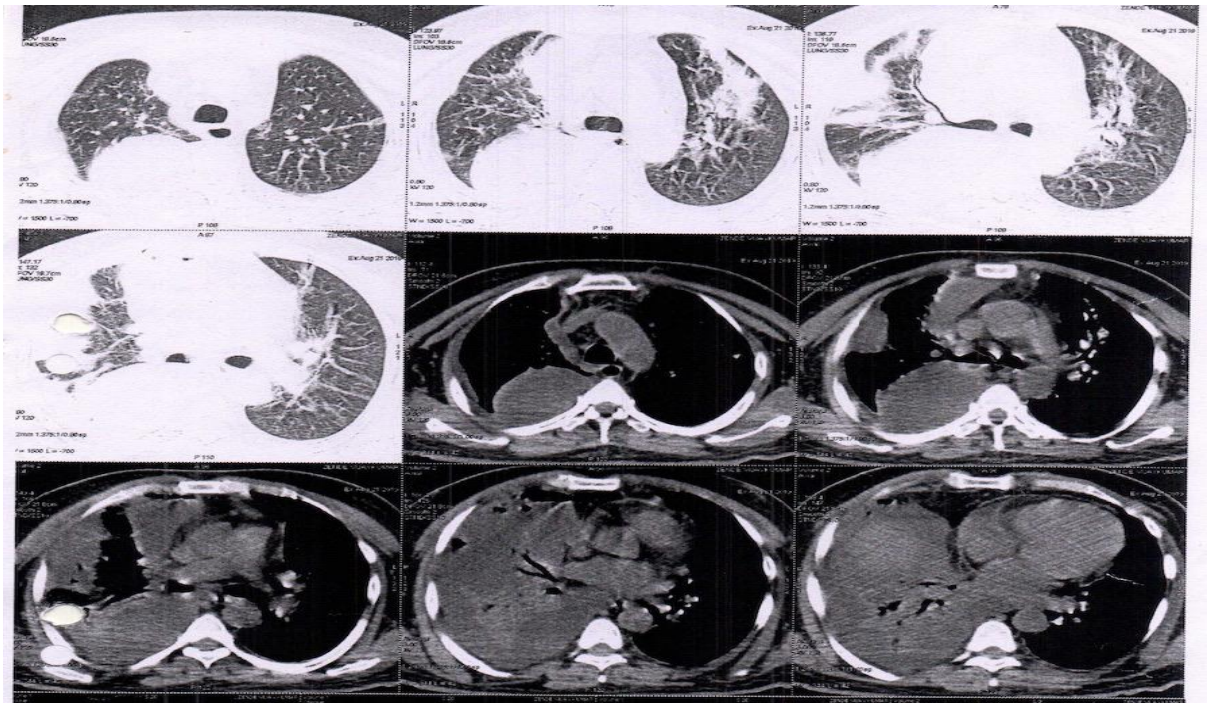
He consulted outside prior one day of admission and his investigations showed WBC count of 17000, HbA1c of 14.2% with fasting sugar 462 and post prandial sugar 498 along with negative Dengue NS1 and IgM antibodies.

On arrival at our hospital, he was tachypnic with respiratory rate of 22/min, spo2 of 91% while breathing on ambient air, Blood pressure was 140/90 mm of Hg, Heart rate was 104/min, on auscultation air entry was reduced on right infra mammary area and crepitations was heard over right infrascapular and infraaxillary area. Chest x-ray showed right lower lobe consolidation with pleural effusion.

On ultrasonography of chest, right lower lobe was consolidated and thick pus was present in the pleural cavity, for which diagnostic tapping was done at the same time. On investigation of the pleural fluid, protein was 3.45, albumin was 1.10, total nucleated cells were 87200/mm^3, among which 93% were neutrophils and 7% were lymphocytes. On gram stain many gram-negative bacilli and gram-positive cocci were seen along with negative acid-fast stain. Pleural fluid LDH was 10990, ADA was 166 and GeneXpert for tuberculosis was negative. So patient was started on meropenem and clindamycin intravenously. Next day he underwent thoracoscopic drainage of empyema along with intrathoracic tube placement and pleural biopsy. After 2 days, pleural fluid culture showed gram positive growth on BacT/ALERT culture system, so teicoplanin was added to the regimen.

On further subculture after 4 days, organism was identified as streptococcus pluranimalium on vitek2 system and drug sensitivity was obtained by Kirby Bauer Disc Diffusion method which showed that Organism was sensitive to all antibiotics including azithromycin, ceftriaxone, clindamycin, levofloxacin, linezolid, tetracycline and vancomycin. Meanwhile, patient developed septic shock and worsening of pneumonia, required inotrope support, mechanical ventilation for 6 days. So, IV clindamycin with IV teicoplanin was continued for 10 days then teicoplanin was stopped and shifted to oral clindamycin once he became hemodynamically stable and oxygen requirement reduced. AFB culture and pleural biopsy culture was negative. Histopathology was consistent with empyema. Oral clindamycin continued for total 6 weeks. Patient was regularly followed up after discharge and repeat chest x-ray at 6 weeks showed resolution of consolidations and effusion along with fibrotic changes in right lower lobe.

Laboratory Marker	Patient's Value On admission	Patient's Value after 6 weeks	Normal Range
Hemoglobin/ hematocrit	12.3/36.2%	11.7/34.7%	13-17 g/dl/40-50%
WBC count	22231	5770	4000-11000 /mm^3
Platelets	4.24 lacs	4.06 lacs	1.5-4.5 lacs/mm^3
Creatinine	2.55	1.49	0.7-1.3 mg/dl
Serum albumin	1.98		>3.5 gm/dl



HRCT (High Resolution Computed Tomography) showing Right lower lobe consolidations with pleural effusion.

Discussion:

Streptococcus pluranimalium is a rare species of streptococcus group which causes infection in humans. Till now, only a few cases reported by this organism in humans. So, details regarding pathogenesis and natural history of this bacteria is not well understood due to rare nature of the organism. Considering data from previous case reports, it is thought that defective immunity has a role in pathogenesis as patient in this case report is diabetic.

In our case report, Diabetic patient presented with right sided empyema and on culture of pleural fluid, streptococcus pluranimalium identified as slow growing gram positive bacterium. On drug sensitivity profile, most antibiotics against gram positive organisms e.g. clindamycin, linezolid, teicoplanin, ceftriaxone, vancomycin are sensitive and patient was treated with clindamycin with teicoplanin for initial days and then oral clindamycin for total 6 weeks. So, third generation cephalosporin, clindamycin, linezolid and vancomycin are mainstay of treatment against infection by this organism.

Conclusion:

This case study demonstrates the first case of empyema by streptococcus pluranimalium. According to present and previous studies, it seems that this organism is a opportunistic organism and it is a slow growing on standard bacterial culture. Third generation cephalosporin, clindamycin, linezolid, teicoplanin and vancomycin forms the therapeutic regimen against this organism.

References:

1. Devriese LA, Vandamme P, Collins MD, Alvarez N, Pot B, Hommez J, Butaye P, Haesebrouck F. Streptococcus pluranimalium sp. nov., from cattle and other animals. International Journal of Systematic and Evolutionary Microbiology. 1999 Jul 1;49(3):1221-6.
2. Twomey DF, Carson T, Foster G, Koylass MS, Whatmore AM. Phenotypic characterisation and 16S rRNA sequence analysis of veterinary isolates of Streptococcus pluranimalium. The Veterinary Journal. 2012 May 1;192(2):236-8.
3. Osman KM, Al-Maary KS, Mubarak AS, Dawoud TM, Moussa IM, Ibrahim MD, Hessain AM, Orabi A, Fawzy NM. Characterization and susceptibility of streptococci and enterococci isolated from Nile tilapia (Oreochromis niloticus) showing septicaemia in aquaculture and wild sites in Egypt. BMC veterinary research. 2017 Dec 1;13(1):357.
4. Facklam R (2002) What happened to the streptococci: Overview of taxonomic and nomenclature changes.ClinMicrobiol Reviews 15(4): 613-630.
5. Vardhana J, Mohanraj K. Brain abscess caused by an unusual organism, Streptococcus pluranimalium in a child with congenital cyanotic heart disease. University Journal of Medicine and Medical Specialities. 2015 Nov 12;1(1).
6. Kalhoro DH, Luo S, Xie X, Zhao YB, Lu CP, Liu YJ. Streptococcus pluranimalium isolated from a canine respiratory case: identification and experimental infection in mice. Pak Vet J. 2015;35:388-90.
7. Maher G, Beniwal M, Bahubali V, Biswas S, Bevinahalli N, Srinivas D, Siddaiah N. Streptococcus pluranimalium: emerging animal streptococcal species as causative agent of human brain abscess. World neurosurgery. 2018 Jul 1;115:208-12.
8. Dhotre SV, Mehetre GT, Dharne MS, Suryawanshi NM, Nagoba BS. Isolation of Streptococcus tigurinus–a novel member of Streptococcus mitis group from a case of periodontitis. FEMS microbiology letters. 2014 Aug 1;357(2):131-5.
9. Fotoglidis A, Pagourelias E, Kyriakou P, Vassilikos V. Endocarditis caused by unusual Streptococcus species (Streptococcus pluranimalium). Hippokratia. 2015 Apr;19(2):182.
10. Ileri Z, Akin M, Erdur EA, Dagi HT, Findik D. Bacteremia after piezocision. American Journal of Orthodontics and Dentofacial Orthopedics. 2014 Oct 1;146(4):430-6.
11. Jacob E, Kiran S, Jithendranath A, Sheetal S, Gigin SV. Streptococcus pluranimalium-close encounter of a new kind. J Assoc Physicians India. 2014;62.
12. Muñoz Ortiz E, Ramírez Urrea JH, Atehortúa Muñoz S, Arévalo Guerrero EF. Infective endocarditis due to Streptococcus pluranimalium: a case report. Archives of Cardiology of Mexico. 2016 Dec; 86 (4): 383-4.
13. Paolucci M, Stanzani M, Melchionda F, Tolomelli G, Castellani G, Landini MP, Varani S, Lewis RE, Sambri V. Routine use of a real-time polymerase chain reaction method for detection of bloodstream infections in neutropaenic patients. Diagnostic microbiology and infectious disease. 2013 Feb 1;75(2):130-4.