Research Paper Medical science

Brucellosis: An under diagnosed infection in Mysore: First case report from a tertiary care hospital

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ABSTRACT

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Background: Brucellosis is one of serious bacterial infection and has a considerable mortality in endemic countries. As signs and symptoms of the infection overlap with many other infectious conditions, it poses a challenge for clinical diagnosis. Methods: We report a first case of culture proven case of brucellosis. A 15 year old male child referred to our hospital for fever of two and half months. Patient was evaluated by serological tests for enteric fever, malaria, rickettsial infections and blood was sent for culture. Brucella melitensis was isolated from blood culture. Serum showed significant titres of brucella antibodies. Patient responded to specific therapy of rifampicin and doxycycline treatment. Conclusion: Brucellosis is endemic in our country, it must be considered when evaluating all cases of prolonged fever.

KEYWORDS Brucella, PUO, Blood culture

Introduction

Brucellosis Is A Highly Contagious Zoonosis Caused By Ingestion Of Unpasteurized Milk Or Undercooked Meat From Infected Animals Or Close Contact With Their Secretions. Brucella Species Are Small Gram Negative, Non Spore Forming Coccobacilli Which Occur As Facultative Intracellular Forms, Often Causing Chronic Disease, Which Usually Persists For Life.[1] *B. Melitensis* Is The Predominant And Virulent Species To Cause Human Infections In India And Also Worldwide Followed By *B. Abortus And B. Suis.* [2, 3] Brucellosis Is Endemic In Northern Parts Of Karnataka, The Reported Seroprevalence Is 3% In Hubli, 1.5% & 8.5% In Bijapur And Belagavi Districts Respectively.[4] Human Brucellosis Clinically Presents As Acute Or Sub Acute And Sometimes As Chronic Febrile Illness Along With Non Specific Symptoms Such As Fatigue, Malaise, Chills, Sweats, Headaches, Myalgia, Arthralgia And Weight Loss. Because Of Non Specific Clinical Presentations, It Is An Under Diagnosed Clinical Condition In Non Endemic Areas.[5]

The Definitive Diagnosis Of Brucellosis Is Based On Isolation Of The Organism From Blood, Body Fluids Or Tissue Specimens[5]. Positive Blood Culture Yield Ranges From 53.4 To 90% And Is Less Commonly Positive For *B.abortus* Than *B.suis* Or *B.melitensis*. [6] In Addition To Culture, Serology For Specific Antibody Detection Is An Alternative Tool For Early Diagnosis; Standard Tube Agglutination (Sat), Is The Widely Used Method. Enzyme Linked Immunosorbent Assay (Elisa), Rose Bengal Plate Agglutination Test (Rbpt), Coombs Test, Immunocapture Agglutination Test, Latex Agglutination, Lateral Flow Assays Have Been Used. Polymerase Chain Reaction (Pcr) Assays Have Been Developed And Are Found To Have Superior Specificity And Sensitivity In Detecting Both Primary Infection And Relapse After Treatment. [7]

Who Recommendation For The Treatment Of Acute Brucellosis In Adults Is Administration Of Rifampicin 600 To 900 Mg And Doxycycline100 Mg Twice Daily For A Minimum Of Six Weeks.[1] Inappropriate Therapy During The Acute Phase Of Infection May Result In Localization Of Bacteria In Various Tissues And Can Result In Subacute Or Chronic Disease Which Can Have Serious Clinical Manifestations.[3] Untreated Brucellosis Can Lead To Osteoarticular, Genitourinary, Gastrointestinal, Nervous, Cardiovascular Complications.[5] High Suspicion, Early Diagnosis And Adequate Treatment Are Essential In Preventing The Complications.

Case Report:

A Male Child Aged 15 Years With The History Of Fever, On And Off Since 2 And Half Months Presented To Our Hospital. He Was Treated In A Local Hospital For The Similar Complaints With No Improvement In His Clinical Condition. Fever Was Not Associated With Chills And Rigors. There Was No History Of Cough, Cold, Vomiting, Loose Stools And Rashes. Patient Had Generalized Convulsions 5 Months Back For Which He Was Started On Sodium Valproate. Family History Revealed Consanguinity In Marriage And Lack Of Institutional Antenatal Care. Developmental Delays Were Noted Since Birth And Was Diagnosed To Have Microcephaly With Global Developmental Delay (Gdd) With Seizure Disorder. Mother Gave History Of Death Of The Child's Sibling Due To Jaundice And Thrombocytopenia 2 Months Back.

At Admission, Patient Was Febrile, There Was No Pallor Or Icterus. Examination Of Cardiovascular System, Respiratory System And Abdomen Were Normal. Central Nervous System Examination Showed Increased Tone, Painful Response To Stimuli And No Signs Of Meningeal Irritation. Patient Was Started On Ceftriaxone With No Clinical Improvement And Was Further Evaluated For Puo. Blood Was Sent For Culture, Total And Differential Counts. Serum Was Sent For Weil-Felix Test, Widal, Dengue, And Were Found Negative. Qbc Test For Malaria Was Also Negative.

Blood Culture By Bact Alert Flagged Positive On Fourth Day, Gram Stain From Blood Culture Broth Showed Gram Negative Coccobacilli, Broth Was Subcultured Onto Blood Agar And Mac Conkey Agar And Incubated At 37° C. Blood Agar Plate Showed Tiny Gray Colonies And Mac Conkey Agar Showed No Growth. Gram Stain From Colonies Showed Gram Negative Coccobacilli Which Was Oxidase Positive & Urease Test Was Positive Within 2 Hours. Vitek-2 Compact Identification System Identified The Isolate As *Brucella Melitensis*. Following The Blood Culture Report, Patient Was Started On Doxycycline And Rifampicin With Clinical Improvement. Sat Showed Titres Of 1:320 And Repeat Blood Culture Also Yielded *B. Melitensis*. Patient's Parents And Grandmother Were Screened For Brucella Antibodies And Were Found Negative. On Probing, Mother Did Recall Instances Where Raw Milk Was Given To The Child. At The Time Of Discharge, Fever Was Subsided, Patient Was Advised To Continue Doxycycline And Rifampicin Drugs For The Total Duration Of 6 Weeks And Patient Was Lost To Follow Up.



Picture 1 Here.

Picture 1. Blood agar showing colonies of brucella

Discussion

Brucellosis Is An Important Public Health Problem Worldwide. In India, It Is Predominantly An Occupational Disease Occurring In Farmers, Veterinarians And Abattoir Workers.[2] People Involved In Agriculture, Animal Husbandry, Are In Close Contact With Domestic Animals Are At Increased Risk For Acquiring Brucellosis.

Brucellosis Mimics Many Clinical Conditions Making It Difficult To Suspect Or Diagnose Clinically. Typhoid, Malaria, Tuberculosis, Rheumatic Fever, Autoimmune Diseases Mimic Human Brucellosis Posing A Problem In Starting The Specific Treatment Early.[3] Many A Time, Uncharacterized Fever Is The Only Major Clinical Presentation In Most Of The Cases. Hence Brucellosis Should Be Kept As One Of The Differential Diagnosis When Evaluating Cases Of Puo And Detailed History Must Be Sought In All Suspected Cases[7].

Brucellosis Can Be Presumptively Diagnosed By Demonstrating High Or Rising Antibody Titers To Specific Brucella Antigens. They Are Useful As A Screening Test In Patients With Suggestive Clinical Features. [8]And They Are The Main Stay Tests In Diagnosing Culture Negative Cases. Routine Serologic Surveillance Is Essential In Detecting More No Of Cases.[2] Isolation Of The Organism Is The Only Standard Method To Confirm Diagnosis. By Gram Stain, Modified Ziehl -Neelsen Staining Along With Urease Test, It Is Possible To Identify The Organism To The Genus Level, Which Is Vital In Institution Of Appropriate Antibiotics. [1, 9]

Symptomatic Cases Among Family Members Is Common, Hence All Family Members Of Index Case Needs To Evaluated To Detect Unrecognized Cases.[4] We Screened Sera Of Grandmother & Parents Who Stay With The Patient But All Sera Showed Negative Results By Sat.

Madhukar Et Al In 2014 Have Isolated Three *B. Melitensis* & Two *B. Abortus* In Human Samples In Mysore.[10] This Study Clearly Shows The Presence Of Brucellosis In This Geographical Area. Seropositivity Has Been Reported On Several Instances In The Past, But This Is The First Culture Proven Case Of Brucellosis From Our Hospital.

Our Patient Was From Agricultural Background With Cattle In The House. Raw Milk Consumption Was The Source Of Infection In This Case. The Patient's Sibling Died Due To Similar Complaints Along With Jaundice And Thrombocytopenia, The Cause Of Death Was Not Evaluated In That Case, Brucellosis Might Have Been Cause In The Case Which Was Missed Because Of Lack Of Suspicion. The Mental Retardation In This Patient Could Have No Contribution To The Infection, Except That There Might Have Been Lapses In Optimum Nutrition And Inadvertent Consumption Of Raw Milk In A Child Caring For Which Might Have Been A Strenuous Task For The Parents.

Brucellosis Poses Significant Diagnostic Challenges To Clinicians, Due To Its Non-Specific Presentations, And The Low Clinical Suspicion Of Clinicians. Therefore, All Patients Must Be Evaluated By Blood Culture And Serology For Brucella In Addition To Routine Work Up In Diagnosing The Cases Of Fever.

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