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Research Article

COAGULATION PROFILE IN PATIENTS SUFFERING FROM ACUTE BRUCELLOSIS

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ABSTRACT

Objective: Although brucellosis has almost been eradicated from most of the developed countries, it still continues to be a major but somehow neglected disease in the developing and underdeveloped countries. In the past, hematological abnormalities like anemia, thrombocytopenia have been reported to be seen in brucellosis patients. The objective of the present study is to observe and study the coagulation profile of patients suffering from acute brucellosis.

Methods: Blood samples were collected from brucellosis patients and healthy volunteers and were analyzed in automated blood coagulation analyzer and automated hematology analyzer to find out the values of prothrombin time (PT), activated partial thromboplastin time (aPTT) and platelet count.

Results: Statistical analysis revealed that there was marginal increase in the aPTT level and platelet count in brucellosis patients than that of the control patients.

Conclusion: The study revealed that there might be a tendency of prolonged aPTT and increase in platelet levels in brucellosis patients.

Keywords: Brucellosis, coagulation profile, prothrombin time (PT), activated partial thromboplastin time (aPTT), platelet count.

INTRODUCTION

Brucellosis is a zoonosis caused by the gram negative Brucella species (Corbel, 1997). Many species of *Brucella* have been discovered till date but four of them are noticed to be most pathogenic to humans. These are *B. melitensis, B. abortus, B. suis and B. canis.* Dogs and pigs host *B. canis* and *B. suis* respectively while *B. melitensis* and *B. abortus* are found mainly in sheep, goats, camels and cattle (El-Koumi et al, 2013).Generally *B. melitensis* and *B. suis* affect humans more than *B. abortus* and *B. canis* but any species of Brucella can cause serious problems (Corbel, 2006).

Common pathways of transmission of this disease are: consumption of unpasteurized milk and other dairy products like cheese, coming in contact with infected animals, inhaling infected aerosols, through conjunctiva or through cuts on skin. Transmission through sexual contact or from mother to progeny is rare but possible ("Diagnosis and Management of Acute Brucellosis in Primary Care". Brucella Subgroup of the Northern Ireland Regional Zoonoses Group. August 2004).

Brucellosis is found to be acute in majority of the cases. The patients mostly suffer from undulant fever, joint and muscle pain, headache, sweats fatigue and weight loss (Atluri et al, 2011).

This highly contagious disease has been eradicated from countries like Ireland ("Ireland free of brucellosis". RTÉ. 2009-07-01), Malta (Rizzo Naudi, 2005). In New Zealand, Brucellosis is limited to sheep only ("MAF Biosecurity New Zealand: Brucellosis". Ministry of Agriculture and Forestry of New Zealand) and in Australia; cattle Brucellosis is eradicated; but pigs are affected by this disease ("Queensland Health: Brucellosis", State of Queensland,Queensland Health, 2010-11-24; Lehane, 1996). But in Middle East, Africa, South East and central Asia, South America and some Mediterranean countries, this disease still prevails infecting animals and as well as human.

Coagulation profile is a screening test that is generally done to identify the reason behind abnormal bleeding of a patient; it may also be requested before a procedure which might cause bleeding such as surgery to confirm that the patient has no problem in blood clotting. A coagulation profile mainly includes Prothrombin time (PT), Activated Partial Thromboplastin Time (aPTT), Fibrinogen Degradation Product (FDP), and Platelet count (Fischbach and Dunning, 2008).

Previously, patients suffering from Brucellosis are reported to have hematological abnormalities like disseminated intravascular coagulation (DIC), anemia, pancytopenia, leukopenia and thrombocytopenia (Akdeniz et al, 1998). As there is no study on Indian population regarding this, we present here coagulation profile of Brucellosis patients and normal, healthy persons to do a comparative study in the levels of PT, APTT and Platelet count.

MATERIALS AND METHODS

Subjects

For the study of coagulation profile, three persons volunteered who were apparently healthy, not taking any medicine and did not have any history of liver disease or any serious disease in the past. They were considered as control of the experiment. Three patients suffering from acute brucellosis were chosen for the comparative study of their coagulation profile. The details of the patients and the volunteers are listed in Table.1.

Selection of patients

The brucellosis patients were selected after performing the following clinical tests, thus confirming the presence of antibodies (Table1) against brucella (a minimum titer of 1:160 was taken reactive for SAT test).

Serum Agglutination Test (SAT)

IgG ELISA
IgM ELISA

Collection of sample

For the test of prothrombin time (PT) and activated partial Thromboplastin time (aPTT) in an automated blood coagulation analyzer, small amount of blood was drawn from the patients as well as the volunteers in test tubes containing the anticoagulant sodium citrate.

To find out the platelet count in an automated hematology analyzer, blood was collected in a small test tubes containing EDTA.

Coagulation profile analysis

For the study of coagulation profile, prothrombin Time (PT), activated partial thromboplastin time (aPTT) and platelet count of the six test subjects were measured in laboratory.

The samples were centrifuged to differentiate the plasma from the blood cells and analysis of the plasma was done in the automated blood coagulation analyzer Sysmex CA-500. The tests were repeated twice and the mean values were taken.

The tests for activated partial thromboplastin time (APTT) were done in a similar procedure using the same instrument as mentioned above.

The platelet count was done in the automated hematology analyzer – Sysmex XT-4000i; (Siemens, Deerfield, IL, USA.). Tests were repeated twice and the mean values were taken.

Statistical analysis

The data was statistically analyzed by performing t-Test assuming equal variances and the difference was considered significant when * $P<0.1$. All the values were expressed as mean ± standard deviation (SD) ± standard error mean (SEM).

RESULT

Apparently there was no significant change in prothrombin time (PT) of the six subjects (Table 2). The aPTT values and platelet count were marginally increased for the patients suffering from acute brucellosis than those of the healthy volunteers (Table.2.).

DISCUSSION

Patients with acute brucellosis are previously reported to have hematological abnormalities like thrombocytopenia, anemia, pancytopenia, leukopenia, and disseminated intravascular coagulation (Akdeniz et al, 1998).

The activated partial thromboplastin time is basically a performance indicator of the coagulation factors involved in the intrinsic and common pathway of coagulation cascade. There was marginal increase in the aPTT level of the patients suffering from acute brucellosis (Table 2). Apparently, it may be due to the increased level of immunoglobulin in brucellosis patients. The markedly increased immunoglobulins in brucellosis might have acted as partial antibody response against factor VIII of intrinsic pathway thus resulting in prolonged aPTT level.

In any chronic inflammation, the platelet count is increased. Brucellosis also causes chronic inflammation (Fretin, 2008). The increase in platelet count may also be due to dysproteinemia which occurs in brucellosis.

CONCLUSION

It may be concluded from the above study that there might be a tendency of increased platelet count and prolonged aPTT levels in patients suffering from acute brucellosis.

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Table.1: Shows details (name, age, sex, religion, SAT test) of the test subjects.

NAME	AGE	SEX	RELIGION	SAT TEST
P.G	24	Male	Hinduism	Positive (1:640)
S.A	32	Male	Hinduism	Positive (1:160)
B.M	50	Female	Hinduism	Positive (1:160)
L.S	38	Female	Hinduism	Negative
R.N	42	Female	Hinduism	Negative
S.G	60	Male	Hinduism	Negative

Table2: Shows levels of PT, aPTT and platelets in control cases and in brucellosis cases

	CONTROL (mean ± SD ± SEM)	TEST (mean ± SD ± SEM)	t- VALUE (±)	p- VALUE
PT (sec)	12.03±0.81 ±0.47	11.93 ± 1.55 ± 0.9	0.099	Not significant
aPTT (sec)	22.1 ± 1.91 ± 1.106	27.07 ± 4.0 ± 2.31	-1.939	Significant at 0.10 level
Platelets (/mm^3)	175000 ± 25000 ± 14433.76	250333.3 ± 82403.48	-1.515	Significant at 0.10 level

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