Comparing Brucellosis Regimens in a Saudi Tertiary Academic Medical Center

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Abstract

Background: Brucellosis is a zoonotic infectious disease caused by *Brucella* spp. that affects multiple body systems and may lead to several complications. Saudi Arabia is one of the countries where brucellosis is endemic. The purpose of this study was to describe the epidemiological characteristics of brucellosis as well as assessing outcomes of different antibiotic regimens.

Methods: A retrospective cohort study was conducted in a Saudi tertiary academic medical center. Eligible patients were adults with confirmed brucellosis (via culture, antibody test, or both) seen between January 2008 and March 2018 who received antibiotic therapy. Endpoints included clinical cure, all-cause mortality, and length of stay (LOS).

Results: Out of 580 patients screened, 79 met the criteria and were included in the study. Based on the most common regimens prescribed, patients were divided into three groups. All groups did not differ in their baseline characteristics except for the location duration of therapy, and the presence of co-infection. The most common risk factor was consumption of raw dairy products and most patients had both *B. melitensis* and *B. abortus* in their culture and/or antibody test. There was no significant difference between the groups in terms of clinical cure, all-cause mortality, and end of therapy parameters.

Conclusion: Due to lack of differences in clinical outcomes, LOS, end of therapy parameters, and only a very small difference in clinical cure between the three groups, a regimen comprising two, rather than three, agents (namely doxycycline and rifampin) can be sufficient. Such finding complies with previous studies although replacing rifampin with an aminoglycoside might be superior per the World Health Organization guidelines for the treatment of brucellosis.

Introduction

- Brucellosis is transmitted from infected animals by direct contact or by indirect methods, such as the consumption of unpasteurized dairy products.[1]
- Brucellosis poses health threats to humans as well as morbidity if untreated. Saudi Arabia is one of the countries that has high reported incidence of brucellosis.[2,3] Currently, there is a lack of studies regarding the epidemiology and treatment regimens in Saudi Arabia.
- We aimed to compare the regimens of antibiotics used in the treatment of brucellosis by the means of clinical success and mortality and determine regimens mostly associated with clinical cure.

Methods

- A retrospective cohort study at King Abdulaziz University Hospital (KAUH), a tertiary academic medical center were performed on 2018.
- 580 patients were screened, of which 79 met the criteria and enrolled in the study.
- Based on the most common regimens prescribed, each patient was assigned to one of three groups.
- Endpoints included clinical cure, all-cause mortality, and length of stay (LOS).

Results

- The most common utilized regimens were doxycycline-rifampin-aminoglycoside (DRA) and doxycycline-rifampin (DR).

- Baseline characteristics:

Characteristic	DRA (n=39)	DR (n=28)	Other (n=12)	P value
Age, years (mean ± SD)	51.3 ± 17	44.7 ± 17.3	46.7 ± 25.7	0.33
Sex, male, n (%)	25 (64.1)	13 (48.1)	8 (66.7)	0.29
Location, n (%)				
Outpatient	18 (46.2)	20 (71.4)	2 (16.7)	**0.01**
Inpatient medical ward	19 (48.7)	8 (28.6)	10 (83.3)	
Duration of therapy (median [interquartile range])	70 [226-347]	45 [0-180]	45 [36-90]	**0.02**
Risk factors, n (%)				
Dairy product	17 (43.6)	15 (53.6)	2 (16.7)	0.53
Direct contact with animals	2 (5.1)	1 (3.6)	1 (8.3)	
Brucella spp., n (%)				
B. melitensis	5 (12.8)	2 (7.1)	2 (16.7)	0.54
B. abortus	2 (5.1)	0 (0)	1 (8.3)	
Both	32 (82.1)	26 (92.9)	9 (75)	

- There was a lack of difference between the groups in terms of clinical cure, LOS, and end of therapy (EOT) parameters (temperature, white blood cells count, and C-reactive protein levels, erythrocyte sedimentation rates), and all-cause mortality.

- Clinical outcomes:

Outcome	DRA	DR	Other	*P* value
Clinical cure, n (%)	32 (82.1)	24 (88.9)	9 (75)	0.73
All-cause mortality, n (%)	0 (0)	3 (11.1)	2 (16.7)	0.03
LOS, days (mean ± SD)	10.8 ±12.1	9.9 ± 6.6	23.4 ± 30.6	0.16
EOT Temp, °C (mean ± SD)	36.6 ± 0.4	36.7 ± 0.6	37 ± 0.1	0.34
EOT WBCs, cells/mm^3 (mean ± SD)	5.8 ± 1.8	7.3 ± 5.5	5.7 ± 2.4	0.35
EOT CRP, mg/L (mean ± SD)	7 ± 13.1	9.7 ± 21.5	22.7 ± 50	0.36
EOT ESR, mm/hr (mean ± SD)	17.3 ± 16.6	9.8 ± 8.9	25.5 ± 37.4	0.26

EOT: end of therapy, Temp: temperature, WBCs: white blood cells, CRP:C-reactive protein, ESR: erythrocyte sedimentation rate

Conclusions

- Male gender were more vulnerable to the disease because of their occupations.
- Unpasteurized raw dairy products and direct contact with the infected animals were the most common risk factors in our patient population.
- Longer durations of therapy did not generally add any benefit.
- Due to the lack of differences between the three groups, a regimen comprising two, rather than three, agents (namely doxycycline and rifampin) can be sufficient.
- Further studies with a larger sample size are warranted to confirm these findings.

References

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Disclosures

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