



Case Report

High Serum Ferritin as a Sensitive Biomarker for Diagnosing, Follow up and Management Responsiveness for Brucellosis

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Abstract

Background: *Brucellosis is one of the most common zoonotic infection worldwide which can cause serious complications such as osteomyelitis, meningitis and severe depression if it's not treated successfully; according to the Official Department of Communicable Diseases/Ministry of Health in Jordan about 455 cases registered who were infected with Brucella during the year 2018.*

55 years old married male retired policeman smoker not known to have previous chronic medical illnesses. Suddenly the patient started suffering from progressive drowsiness and intermittent sensing of rotation followed by excessive night sweating and loss of appetite; he consulted several doctors who Primary diagnosed him as iron deficiency anaemia and an oral iron therapy supplement was prescribed for him; others diagnosed him as Upper Respiratory Tract Infection and oral antibiotics were prescribed for him, but with no significant improvement happened; after he was being evaluated and investigated in an outpatient clinic by a family medicine specialist who surprisingly noted a high serum ferritin level which guided the physician to expect an underlying inflammatory process (Pulmonary Tuberculosis, Brucellosis, Typhoid fever and Major Depression as differential diagnosis) which in its order guided the physician to reach to the exact diagnosis, also the declining level of ferritin help him for following up and expecting the degree of successful treatment for brucellosis.

Conclusion: *High serum ferritin level could be a useful guideline and director for diagnosing follow up and successful management of Brucellosis. This result encouraged me to think if there is a significant relationship between high serum ferritin and Brucella infection and if it can be used as a biomarker for diagnosing follow up and as a sensitive guideline for successful management for Brucella infection.*

Keywords: *High Serum Ferritin, Brucellosis.*

Background

Since the time of Hippocrates, brucellosis is a well-known multisystem disease that contains many different clinical features and complications.

The main ways of transmission have been reported as infected milk and milk products via dietary intake, inhalation of stable powders from the habitat of infected animals or skin contact with

infected animals and animal products. The main common clinical symptoms and findings in most patients are high fever, muscle joint pain, fatigue and anorexia. Diagnosis is usually confirmed via the result of clinical features, serology or culture. In an organism, a systemic response begins within hours or days. The condition is likely to cause an inflammatory process and this response is defined as an acute phase response. Because brucellosis is an infectious disease, it increases acute phase reactants such as C-reactive protein (CRP) and ferritin⁽¹⁾

Case Presentation

A 55 years old married male, retired policeman, smoker, not known to have previous chronic medical illnesses, a father for 5 children after he was retired from the general security, he worked dedicatedly as a private driver for a businessman and his family for ten years to improve his low monthly income but unfortunately, in 2017 he was fired from his job after the death of that businessman, this condition caused a psychological trauma for him and made him unhappy.

In the morning of a Friday which was the 2nd of November 2018, the patient felt that he is not well and drowsy with mild abdominal pain, he decided to enter the bathroom to induce vomiting where he became more drowsy and sensed of rotation followed by transient loss of consciousness and fallen down with the history of head trauma, then he regained consciousness and got out from the bathroom not knowing what happened to him there.

In the same day while He was taking his breakfast with his family, they noted a wound on the back of his head they were worried about him but the patient ensured them, afternoon of that day after lunch the patient returned to his bedroom to take a rest, He felt more drowsy like an earthquake happened and loss of equilibrium, then he got out toward the sitting room where his family was there and he fallen down on the sofa, his family immediately phoned the civilian defense which

transported him to a peripheral hospital emergency room where he was given IV fluid and diagnosed as iron deficiency anemia and oral iron therapy was prescribed for him and discharged; but the patient was not improved in contrast the patient started suffering from worsening in his condition associated with excessive night sweating and loss of appetite with mild intermittent dry cough and running nose he consulted a general practitioner in a public health center who diagnosed him as an upper respiratory tract infection and prescribed an antibiotic for him but the patient was not improved; then the patient decided to consult a family medicine specialty clinic in a peripheral hospital where complete detailed history and physical examination and laboratory investigation were obtained from the patient; the significant finding in laboratory investigation was a high serum ferritin level (444ng/dl) (the normal referral range less than 200ng/dl); this high serum ferritin guided me to think about an underlying inflammatory disease responsible for this high serum ferritin and according to the symptoms mentioned by the patient (excessive night sweating, loss of appetite, and cough) (Pulmonary Tuberculosis (TB), Brucellosis, Typhoid fever and major depression were considered as a differential diagnosis for this case). Chest x-ray(figur1), Serum Brucella and Widal tests were requested which showed a normal chest x-ray but surprisingly a very high Serum Brucella titer (Brucella abortus IgM Antibodies titer more than 1/1280). (Table1)

This result encouraged me to think if there is a significant relationship between high serum ferritin and Brucella infection and if it could be used as a biomarker for diagnosing follow up and successful management for Brucella infection.

After 6 weeks course of double antibiotics (Rifampicin capsule 300mg twice daily and Doxycycline capsule 100mg twice daily) After which the patient's general condition and symptoms were significantly improved(Serum Brucella abortus Antibodies titer negative) After the course of treatment and improvement, the

decision was to measure the Serum Ferritin Level in order to see if it decreased or remained high as it was; the Serum Ferritin excitedly was fallen to a level of 170.3 ng/dl (normal referral range of Serum Ferritin less than 200ng/dl), so the

conclusion is that the Serum Ferritin can be used as a Sensitive Biomarker for diagnosing, follow up and management responsiveness for Brucella infection. (Table1)

Radiographies and laboratory investigations



Figure 1 Chest x-ray

Table 1 Shows the related main investigations results in sequence

Collection Date	Test	Result/ Status	Flag	Units	Reference Range
Nov 5,2018	FREE T4	15.98		Pmol/L	12-22
Nov 5,2018	TSH	2.58		U/ml	0.2 - 4.2
Nov 5,2018	VITAMIN 12	324.3		Pg/ml	211-945
Nov 5,2018	FERRITIN	444.8		ng/ml	
Nov 5,2018	ERYTHROCYTE SEDIMENTATION RATE (ESR)	65	H	Mm/hr	Ref<= 15
Nov 5,2018	WBC	4.83		10 ⁹ /L	
Nov 5,2018	RBC	4.70		10 ¹² /L	
Nov 5,2018	HGB	13.4		g/dl	
Nov 5,2018	HCT	38.1		%	
Nov 5,2018	MCV	81.1		fl	
Nov 5,2018	MCH	28.5		Pg	
Nov 5,2018	MCHC	35.2		g/dl	
Nov 5,2018	RDW	11.8		%	11 - 16
Nov 5,2018	PLATELETS	183		10 ⁹ /L	150- 400
Nov 5,2018	MPV	10.8		Um3	6 - 11
Nov 5,2018	PCT	.20		%	0.15- 0.500
Nov 5,2018	PDW	12.3		%	11 - 18
Nov 5,2018	NEUTROPHILS%	45.6		%	40 - 80
Nov 18,2018	WIDAL SCREENING	NEGATIVE			
Nov18,2018	BRUCELLA TEST	POSITIVE			
Nov 18,2018	RUCELLA ABORTUS	>1280			
Feb 11,2019	BRUCELLA TEST	NEGATIVE			
Feb 11,2019	VITAMINE 12	426.2		pg/ml	211- 945
Feb 11,2019	FERRITIN	170.3		Ng/ml	

Conclusion

High serum ferritin level could be a useful guideline and director for diagnosing, follow up, and successful management of Brucellosis. This

conclusion is confirmed by previous case studies presented by (Almirón, M. A., & Ugalde, R. A., 2010) and (Arica, Vefik, et al., 2012).

Acknowledgements

For Prince Hussein bin Abdullah II hospital, Laboratory Department Staff Specialty Mrs.Randa Hojaa and her Colleagues in the Hormonal Section.

Funding: The authors received no specific funding for this study.

Ethics Declarations: Ethics approval and consent to participate

Not applicable.

Consent for Publication: Written informed consent was obtained from the patient for publication of this case report and any accompanying images. A copy of the written consents is available for review by the Editor-in-Chief of this journal.

Competing Interests: The authors declare that they have no competing interests.

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