LETTER TO EDITOR

Blood culture of *Brucella*, challenges and limitations

Sir,

Diagnosis of brucellosis is still facing problems in both aspects of "clinical and Laboratory diagnosis". Recent analysis report of brucellosis incidence indicates more than ten times higher frequency rate in the west, North-West, and North-East than the average rate of the country (38.67/100 000).[1] This high rate in endemic areas definitely proves problems in diagnosis. Classical methods could not alone meet clinicians' demands, especially blood culture that may rarely be positive in the absence of positive serological procedures, although its use is necessary in some cases. However, *Brucella* species can be isolated from other specimens with high efficiency such as bone marrow, cerebrospinal fluid, and so on since the relatively high concentration of *Brucella* in these specimens. Improving biphasic culture media by adding enriched supplements or preparing selective blood culture media has not been able to considerably increase the isolation rate. The reported identification rates are mostly too low with about 2% in clinical laboratories.[2-4] Besides all drawbacks, long incubation time is another problems, carrying up to six weeks before rejected as negative.[5]

Some references recommend blood specimens to be pretreated by applying lysis centrifugation or clot culture technique to enhance the efficiency of isolation. In these methods, blood cell disrupted and lysed by sterile distilled water followed centrifugation or clot disrupted by shaking the tube-containing glass beads. These methods may increase the sensitivity, but it is not practical in routine work because of its requirement for standard biosafety level moreover may increase the risk of contamination of the specimens.[2] Facility assessment has also revealed biosafety status has not possessed all of the required biosafety elements.[6] With introducing of automated blood culture systems to the diagnostic laboratories, requisite time for detection has been significantly reduced so that *Brucella* can be detected in the blood specimens of infected patients after 4 days or less with significantly higher rate than routine method. Some of the current-applying systems are BACTEC and BacT/Alert which continuously monitor the CO_2 release of potentially growing microorganisms and BACTEC Myco/Flytic system which integrates lytic activity and automation.[7,8] At present, Health Center Laboratories are applying only classic serology tests "agglutination-based methods" not other procedures in all over the country. Physicians are introducing patients to the laboratory of either hospitals or private diagnostic sectors for isolations in the necessary cases.

In conclusions, based on surveillance reports, the current situation is still involving various difficulties causing reduction of efficiency. Therefore, this procedure is not cost effective in all over the country. It is strongly recommended to have some national referral laboratories in those areas with a high incidence rate at least. These referral laboratories must be enabled to apply all available methods, including a new automated system in parallel with routine laboratories. All those extremely suspected cases having negative results expected to be sent for these laboratories for further experiments. These centers should enable to do all diagnostic methods; serological tests (agglutination-based ones, ELISA, *Brucella* immunocapture, and atc), molecular technique, and culture.[8] Obviously equipped these laboratories with automated system provide satisfactory results for the blood specimens.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

Massoud Hajia

Department of Medical Microbiology, Research Center of Health Reference Laboratory, Tehran, Iran

Address for correspondence: Prof. Massoud Hajia, Reference Health Laboratory, #48, Keykhosro Shahrokh Alley, Zartoshtian Street, Hafez Avenue, Tehran 1131636111, Iran.
E-mail: hajia@health.gov.ir

REFERENCES

1. Pakzad R, Pakzad I, Safiri S, Shirzadi MR, Mohammadpour M, Behroozi A, *et al*. Spatiotemporal analysis of brucellosis incidence in Iran from 2011 to 2014 using GIS. Int J Infect Dis 2018;67:129-36.
2. Hajia M, Rahbar M. Isolation of *Brucella* from blood culture of hospitalized brucellosis patients. Iran J Clin Infect Dis 2006;1:5-10.
3. Hajia M, Keramat F. Study on the rate of brucellosis relapse and efficiency of different treatment protocols among hospitalized patients. Mil Med 2003;5:195-9.
4. Hajia M, Fallah F, Angoti G, Karimi A, Rahbar M, Gachkar L, *et al*. Comparison of methods for diagnosing brucellosis. Lab Med 2013;44:29-33.
5. Traxler RM, Lehman MW, Bosserman EA, Guerra MA, Smith TL. A literature review of laboratory-acquired brucellosis. J Clin Microbiol 2013;51:3055-62.
6. Hajia M, Safadel N, Samiee SM, Dahim P, Anjarani S, Nafisi N, *et al*. Quality assurance program for molecular medicine laboratories. Iran J Public Health 2013;42:119-24.
7. Amirzargar A, Hassibi M, Maleknejad P, Piri-Dougahe H, Jafari S, Soud Bakhsh AR, *et al*. Comparison of diagnostic

methods in hospitalized patients with brucellosis in Iran. Inf Dis Clin Pract 2009;17:239-42.
8. Momen-Heravi M, Erami M, Kosha H, Eshratabadi F. Diagnosis of brucellosis via BACTEC blood culture system. J Isfahan Med Sch 2015;32:2234-40.

Access this article online

Quick Response Code:

Website: www.jmsjournal.net

DOI: 10.4103/jrms.JRMS_268_18

How to cite this article: Hajia M. Blood culture of *Brucella*, challenges and limitations. J Res Med Sci 2018;23:92.