

[LETTERS TO THE EDITOR]

The Diagnostic Yield of Urine Cultures with Liquid Media in Cases of Miliary Tuberculosis

Key words: miliary tuberculosis, urine, liquid culture media

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To the Editor We read with interest the article of Yokoyama et al. (1) about the detection rates of *Mycobacterium tuberculosis* (*M. tuberculosis*) in urine samples from patients with miliary tuberculosis (MiTB). They demonstrated high detection rates (86%) of *M. tuberculosis* using the combination of a polymerase chain reaction (PCR) and culturing of urine specimens in 14 cases of suspected MiTB. Recently, automated liquid culture systems have been widely used for mycobacterial culturing. However, limited data are available regarding the yields of liquid and solid media cultures of urine samples from patients with MiTB. Thus, we compared the yields of liquid and solid media cultures of urine samples from patients with MiTB.

Data from patients who were consecutively diagnosed with MiTB at Kyungpook National University Hospital, South Korea between May 2011, when the mandatory implementation of combined solid and liquid media was introduced for mycobacterial culturing, and December 2016 were retrospectively reviewed. A diagnosis of MiTB was made based on the following criteria: 1) a clinical presentation consistent with TB (e.g., fever, night sweats, anorexia, and weight loss) and a response to anti-TB treatment, 2) a miliary pattern on chest radiograph or high-resolution CT, and 3) microbiological and/or histological evidence of TB (2). Seventy-nine patients were diagnosed with MiTB during study period. Among them, 25 patients for whom liquid and solid urine culture results were available were included in this study.

The 25 MiTB patients included 24 cases in which a positive *M. tuberculosis* culture was obtained from sputum/bronchial aspirate and/or urine, pleural fluid, and bone tissue and 1 case in which granulomatous inflammation with a positive TB-PCR was noted from a spinal tissue biopsy specimen. *M. tuberculosis* culturing was performed by inoculating urine specimens into BACTEC MGIT 960 liquid medium (BD Diagnostic Systems, Sparks, USA) and 3% Ogawa solid medium (Shin-yang Chemical, Seoul, Korea) in a laboratory; these cultures were incubated for 6 weeks and 8 weeks, respectively (3).

The culture-positive yields from urine cultures in liquid

Table. Comparison of Solid and Liquid Culture Media for Isolation of *Mycobacterium tuberculosis* from Urine in Patients with Miliary Tuberculosis.

	Liquid (BACTEC MGIT 960)		
	Positive	Negative	Total
Solid (Ogawa)			
Positive	3 (12)	0 (0)	3 (12)
Negative	5 (20)	17 (68)	22 (88)
Total	8 (32)*	17 (68)	25 (100)

Data are presented as number (%).

* p<0.05, comparison of diagnostic yield between liquid and solid culture media by McNemar's test.

and solid media are summarized in the Table. Of the 25 urine samples, 8 (32%) were culture-positive with either liquid or solid medium and 3 (12%) were positive with both media. Five (20%) samples were culture-positive with liquid media alone. The positive yield (32%) of cultures by liquid media was significantly higher than that of cultures by solid media (12%) (p=0.031 by McNemar's test).

In the present study, the *M. tuberculosis*-positive culture rate from urine samples was relatively low in comparison to the study by Yokoyama et al. (1); however, the total positive culture rate (including liquid and solid media) did not differ to a statistically significant extent (32% vs. 57%, p=0.126). Our findings showed that the use of liquid medium increased the diagnostic yield by a further 63% in comparison to solid media alone. In the era of liquid culture systems, the combination of liquid and solid culturing and a PCR of urine specimens may help to improve the diagnosis of MiTB.

The authors state that they have no Conflict of Interest (COI).

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