



Comparison of BACTEC MYCO/F Lytic Bottle to the Wampole Isolator for Recovery of Fungal and Mycobacterial Organisms

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Abstract

Background:

The Wampole Isolator lysis centrifugation tube (Alere) and the BACTEC MYCO/F Lytic bottle (Becton Dickinson) are used to enhance recovery of fungal and mycobacterial organisms from blood. Literature supporting this practice is nearly 20 years old and changes have occurred in organism diversity, as well as with increasing demand for cost justified procedures. This study examined whether the Isolator continues to be vital for recovery of these organisms.

Methods:

Blood was collected by a phlebotomy team and distributed into three blood culture receptacles: one Isolator tube with 8 mL of blood and 2 MYCO/F Lytic bottles each with 4 mL of blood. The sediment from the processed Isolator tube was inoculated onto Inhibitory Mold Agar, Emmons Sabouraud Dextrose Agar, and Middlebrook 7H11/7H11 Selective Agar. Plated media was incubated for 30 days and bottles for 42 days on the BACTEC FX instrument. We compared the recovery of fungal and mycobacterial organisms from the Isolator system and MYCO/F Lytic bottles at our institution from December 2011 through February 2016.

Results:

174 (2%) cultures were positive with fungal or mycobacterial isolates from a total of 8293 cultures. *Candida* spp. (n=57), *Mycobacterium avium* complex (n=34) and *Histoplasma capsulatum* (n=28) were the most common organisms. Among 28 isolates of *H. capsulatum*, 15 grew from the Isolator system only, 1 in the MYCO/F Lytic bottle only and 12 grew from both the Isolator and the MYCO/F Lytic bottles. 3/7 isolates of *Cryptococcus neoformans* grew in the Isolator system only.

Conclusion:

The Isolator system increases the recovery of certain fungal and mycobacterial organisms from blood as compared with the MYCO/F Lytic bottle alone.

Background

The optimal method for recovery of fungal and mycobacterial organisms from blood is unclear. The Wampole Isolator lysis centrifugation tube (Alere) and the BACTEC MYCO/F Lytic bottle (Becton Dickinson) are used to enhance recovery of fungal and mycobacterial organisms from blood. Literature supporting the use of the Isolator system is decades old. A recent study found low utility of the Pediatric Isolator system for detection of fungemia in children (Campigotto et al, 2016). This study examined whether the Isolator system continues to be vital for recovery of these organisms.

Objectives

To compare the recovery of fungal and mycobacterial organisms from the Isolator system and MYCO/F Lytic bottles at our institution.

Methods

1. Blood was collected by a phlebotomy team and distributed into three blood culture receptacles: one Isolator tube with 8 mL of blood and 2 MYCO/F Lytic bottles each with 4 mL of blood.
2. The sediment from the processed Isolator tube was inoculated onto Inhibitory Mold Agar, Emmons Sabouraud Dextrose Agar, and Middlebrook 7H11/7H11 Selective Agar.
3. Plated media was incubated for 30 days and bottles for 42 days on the BACTEC FX instrument.

We compared the recovery of fungal and mycobacterial organisms from the Isolator system and MYCO/F Lytic bottles at our institution from December 2011 through February 2016.

Results

Comparison of BACTEC Myco/F Lytic bottle to Isolator system				
Organism	No. of organisms			Total
	+ with Isolator system only	+ with BACTEC Myco/F lytic bottle only	+ with both Isolator system and Myco/F lytic bottle	
<i>M. avium</i> complex	1	12	21	34
<i>Histoplasma capsulatum</i>	15	1	12	28
<i>Candida glabrata</i>	5	5	7	17
<i>Candida albicans</i>	2	9	5	16
<i>Candida parapsilosis</i>	1	3	9	13
<i>Mycobacterium abscessus</i> group	1	1	5	7
<i>Cryptococcus neoformans</i>	3	0	4	7
<i>Mycobacterium chelonae</i>	0	2	2	4
<i>Streptomyces</i> sp.	2	1	0	3
<i>Mycobacterium tuberculosis</i> complex	0	1	2	3
<i>Mycobacterium malmoense</i>	0	3	0	3
<i>Mycobacterium bovis</i> BCG	1	2	0	3
<i>Fusarium</i> sp.	0	2	1	3
<i>Trichosporon mucoides</i>	2	0	0	2
<i>Mycobacterium chimaera</i>	0	2	0	2
<i>Candida tropicalis</i>	0	2	0	2
<i>Candida lipolytica</i>	2	0	0	2
<i>Candida krusei</i>	0	1	1	2
<i>Saccharomyces cerevisiae</i>	1	0	0	1
<i>Rhodotorula mucilaginosa</i>	0	1	0	1
<i>Rhodotorula minuta</i>	1	0	0	1
<i>Rhodococcus</i> sp.	0	1	0	1
<i>Mycobacterium mucogenicum/phocaicum</i>	0	0	1	1
<i>Mycobacterium marinum</i>	0	0	1	1
<i>Mycobacterium haemophilum</i>	0	0	1	1
<i>Mycobacterium genavense</i>	0	1	0	1
<i>Mycobacterium fortuitum</i> group	0	0	1	1
<i>Micromonospora</i> sp.	1	0	0	1
<i>Lichtheimia (Absidia)</i> species	1	0	0	1
<i>Gordonia otitidis</i>	1	0	0	1
<i>Gordonia bronchialis</i>	1	0	0	1
<i>Dietzia cinnamea</i>	0	1	0	1
Dematiaceous fungus not further identified	1	0	0	1
<i>Cryptococcus laurentii</i>	1	0	0	1
<i>Candida</i> species	1	0	0	1
<i>Candida pelliculosa</i>	1	0	0	1
<i>Candida orthopsilosis</i>	0	1	0	1
<i>Candida norvegensis</i>	0	0	1	1
<i>Candida dubliniensis</i>	1	0	0	1
<i>Aureobasidium/Hormonema</i> species	1	0	0	1
<i>Alternaria</i> species	1	0	0	1
Total	48	52	74	174

Results

- Among a total of 8293 cultures, 174 (2%) cultures were positive with fungal or mycobacterial isolates.
- *Candida* sp. (n=57), *Mycobacterium avium* complex (n=34) and *Histoplasma capsulatum* (n=28) were the most common organisms.
- Among 28 isolates of *H. capsulatum*, 15 grew from the Isolator system only, 1 grew in the MYCO/F Lytic bottle only and 12 grew from both the Isolator and the MYCO/F Lytic bottles.
- Three among 7 isolates of *Cryptococcus neoformans* grew in the Isolator system only.
- One of 3 isolates of *Mycobacterium bovis* BCG grew in the Isolator system only.

Conclusions

- The Isolator system increases the recovery of certain fungal organisms, most notably, *Histoplasma capsulatum*, from blood as compared with the MYCO/F Lytic bottle alone.
- The Isolator system may not be required when Myco/F Lytic broth bottles are used for the recovery of *Mycobacterium* species.

References

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