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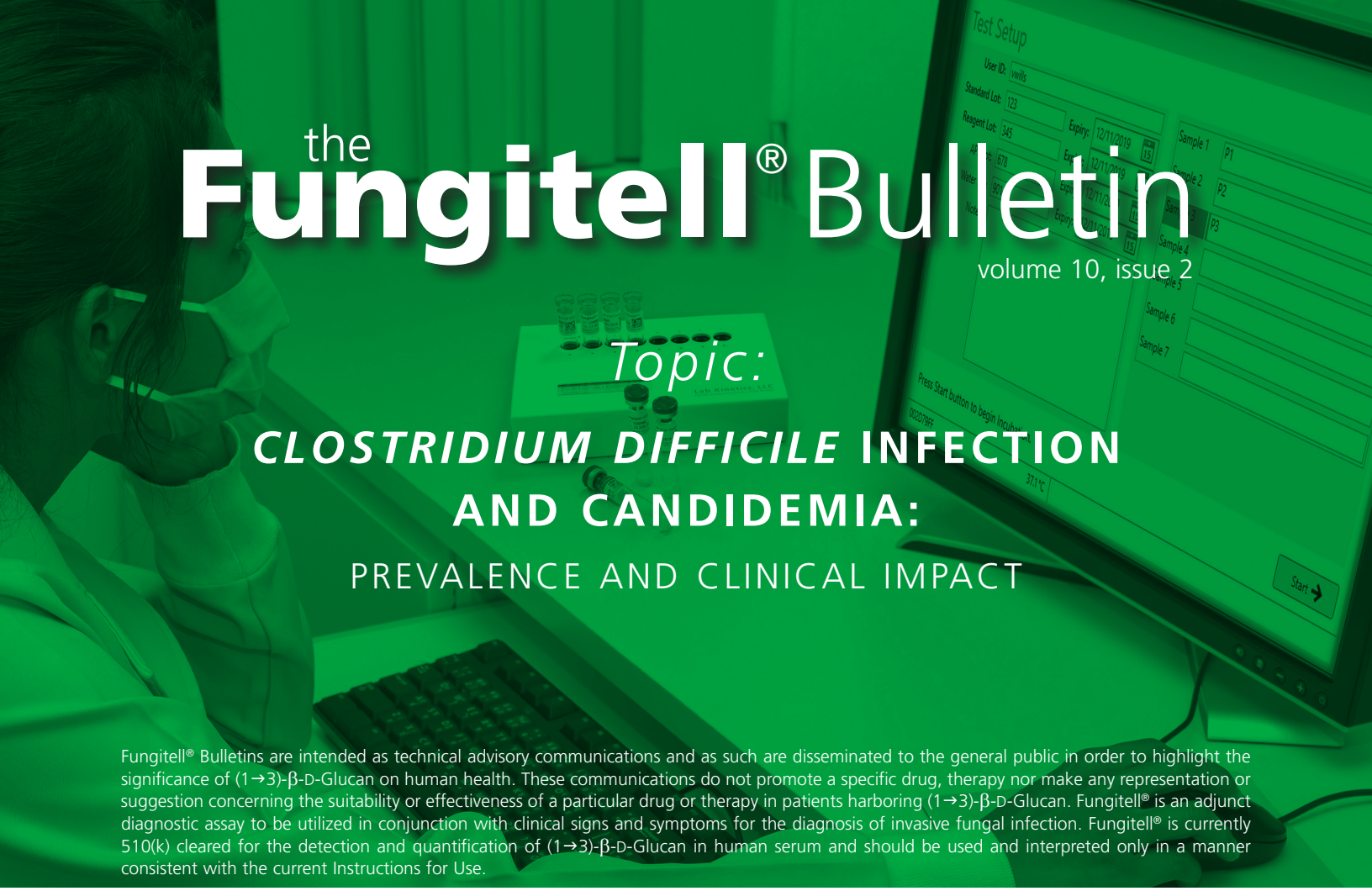

Topic:

CLOSTRIDIUM DIFFICILE INFECTION AND CANDIDEMIA:

PREVALENCE AND CLINICAL IMPACT

Discussion:

Both *Clostridium difficile* and *Candida* spp. are considered normal components of the intestinal microbiota. They are also opportunistic pathogens. The global burden of CDI is significant. Balsells, E., *et al.,* (2019) conducted a meta-analysis of hospital-onset health-care facility-associated CDI for the period 2005-2015. 41 countries were covered. The rate of HCF-CDI was 2.24/1,000 admissions/yr and 3.54/10,000 patient-days/yr. Intensive care unit and internal medicine ward rates of CDI were observed to be much higher at 11.08 and 10.8 per 1,000 admissions/yr, respectively. Community-acquired CDI was found to be much lower at 0.55/1,000 patient admissions/yr.

The administration of gut-active antibacterials has been observed to potentiate gut microbial dysbiosis and *Clostridium difficile* overgrowth (*Clostridium difficile* infection or CDI) which, in the circumstance of CDI due to toxigenic clostridial strains, leads to intestinal mucosal barrier damage, diarrhea, and life-threatening illness (Dilnessa, T., *et al.,* 2022). Vancomycin, a commonly administered antibacterial has been well studied as a risk factor for candidemia in the setting of CDI. In addition to the CDI pathophysiology, patients are also at a greatly increased risk of candidemia, resulting from translocation of *Candida* cells from the gut lumen to the circulation. Risk factors for candidemia in the setting of CDI include *Candida* ribotype 027 strain (Odds Ratio: [OR], 4.5]; relapse of CDI, OR: 5.9; severe CDI, OR: 4.4; # relapses >1, OR: 3.1; Vancomycin >1000 mg/day, OR: 2.1; immunosuppressive therapy, OR: 2.2 (Russo, A., *et al.,* 2015). An analysis by the USA Centers for Disease Control found that CDI occurred at a rate of 453,000 cases per year in the USA, with a candidemia attack level of 46,000/yr. The mortality for CDI was estimated at 9% and that for candidemia, 30%. CDI-candidemia co-infection mortality was not found to be significantly different from candidemia alone (Tsay, S., *et al.,* 2019). The role of different antibiotics and gut *Candida* numbers has been extensively studied and fecal population observations of 1 – 2.5 log increases have been demonstrated (Thomakos, N., *et al.,* 1998; Samonis, G. *et al.,* 1993; Samonis, G.,

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CLOSTRIDIUM DIFFICILE INFECTION AND CANDIDEMIA: PREVALENCE AND CLINICAL IMPACT

et al., 2001; Maraki, S. J., *et al.,* 2003; Samonis, G. *et al.,* AAC. 2005). Accordingly, the administration of antibiotics in the setting of CDI bears the strong likelihood of dramatically increasing *Candida* populations in a damaged mucosal barrier setting where translocation is of great concern.

Falcone et al (2016) proposed an algorithm which included the use of serum (1→3)-β-glucan (BDG) diagnostic surveillance of CDI patients at elevated risk of candidemia. This approach has been supported by animal modeling. Leelahavanichkul, A. *et al.,* (2016) demonstrated, in a murine model, that gastrointestinal tract mucosal barrier damage due to CDI led to the elevation of serum levels of BDG and markers of pathophysiology. Subsequently, the same group was able to demonstrate in the murine model, that the addition of an oral *Bifidobacterium* consortium [*Bifidobacterium adolescentis*-B24 (BA-B24) and *Bifidobacterium catenulatum*-NB38 (BC-NB38), mitigated the adverse symptoms and candida overgrowth, with reduced translocation markers (Panpetch, W. *et al.,* 2019).

The clinical assessment of risk factors associated with the translocation of gut commensals/opportunistic pathogens represents a promising area of investigation for the prevention of life-threatening infections. The CDI-candidemia coinfection circumstance suggests a very useful application of (1→3)-β-glucan surveillance.

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