

## 279. Evaluation of $\beta$ -D-Glucan Utilization in Thailand: Single Academic Center Experience

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Session: 40. Fungal Diagnostics

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**Background.**  $\beta$ -D-glucan (BG) detection was first available in Thailand in 2016 to aid diagnosis of invasive fungal infections (IFIs). Given a paucity of real-world experience of BG use in resource-limited countries, this study was conducted to describe appropriateness of BG testing and sequelae of BG results.

**Methods.** A retrospective study included all patients with at least 1 BG ordered at King Chulalongkorn Memorial Hospital, Bangkok, Thailand during March 2016 to December 2018. Descriptive statistics were used.

**Results.** 83 patients were tested by BG assay (Fungitell, Associates of Cape Cod, Inc.): 6 with hematopoietic stem cell transplant, 12 with solid-organ transplant, 20 with active cancer receiving chemotherapy, 34 receiving high dose steroids ( $\geq 20$  mg/day of prednisone for  $\geq 3$  weeks) and 11 with other conditions. Seventy-three patients were tested under infectious disease (ID) service's recommendations. There were 13 and 20 cases of proven and probable IFIs, respectively. Among 13 proven IFIs, there were 11 positive, 1 indeterminate and 1 negative (mucormycosis) BG results. Among 49 cases with positive BG results, 24 were determined to be false-positive results. Median turn-around time for BG results was 16 (IQR: 9–23) days. Due to high turn-around time, only 8 patients were started on antifungal agent(s) and 3 underwent bronchoscopy due to positive BG results. All proven IFI cases were started on antifungal treatment prior to BG availability.

**Conclusion.** Approximately 87% of BG use in Thailand was ordered in patients with risk factors for IFIs. This could be due to majority of BG test was recommended by ID specialist. Despite being used in right clinical context, 49% had false-positive BG results. Another barrier of BG use in Thailand was high turn-around time due to small numbers of BG ordered and relative high cost to run the assay. Therefore, the utility of BG for aiding diagnosis or management of fungal infection in our setting is limited.

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## 280. Monitoring Serum Erythrocyte Sedimentation Rate (ESR) and C-Reactive Protein (CRP) in Correlation with (1–3)- $\beta$ -D-Glucan Levels in Vascular Pythiosis: A Preliminary Study

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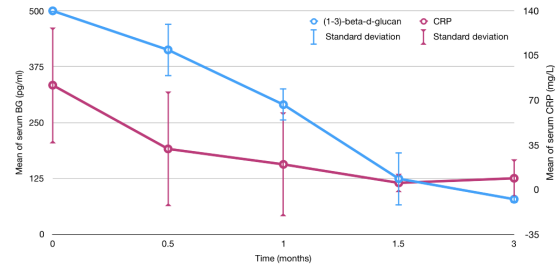
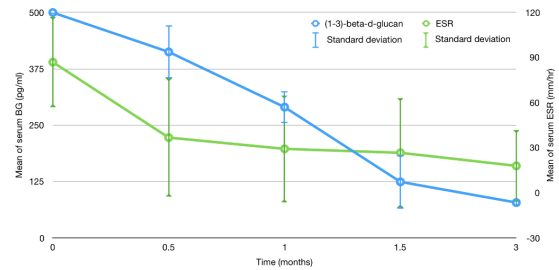
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**Background.** Vascular pythiosis, caused by *Pythium insidiosum*, is a life-threatening disease despite aggressive treatment. Our recent study showed that serum  $\beta$ -D-glucan (BG) trends can be used to monitor disease activity after treatment initiation. A significant decline in BG by 0.5 month indicated complete resection without residual disease. However, BG assay is cost prohibitive and available only at King Chulalongkorn Memorial Hospital in Thailand. This study was conducted to preliminarily evaluate erythrocyte sedimentation rate (ESR) and C-reactive protein (CRP) as monitoring tools.

**Methods.** A prospective study included proven vascular pythiosis patients receiving treatment with combination therapy from November 2018 to January 2019. Clinical information, BG, ESR, and CRP were collected at 0, 0.5, 1.5, and 3 months post diagnosis. Spearman's correlation coefficient and analysis of response profiles were used.

**Results.** Six patients were enrolled. All had thalassemia. Four developed disease at popliteal artery, 1 at common iliac artery, and 1 at brachial artery. All underwent amputation with negative surgical margins achievement. All received itraconazole, azithromycin, and *P. insidiosum* immunotherapy. One received terbinafine and one received doxycycline additionally. All had positive BG > 500 pg/mL at diagnosis. After treatment initiation, means of ESR were significantly decreased at 0.5 months ( $P = 0.02$ ). Means of CRP were not significantly changed until 1 month ( $P = 0.02$ ) (Figure 1a and b). Correlation coefficients between BG and ESR vs. BG and CRP were 0.74 and 0.65, respectively. All survived without relapse at 3 months.

**Conclusion.** ESR and CRP are potentially valuable markers to monitor vascular pythiosis in resource-limited countries. However, ESR levels and trends seem to be correlated with BG better than CRP. Further studies are needed to enroll more patients, especially patients with incomplete resection or non-surgical candidates.



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## 281. Hypersensitivity Pneumonitis Diagnosed with Broad-Range PCR Testing after Exposure to *Battarrea* Mushroom Spores

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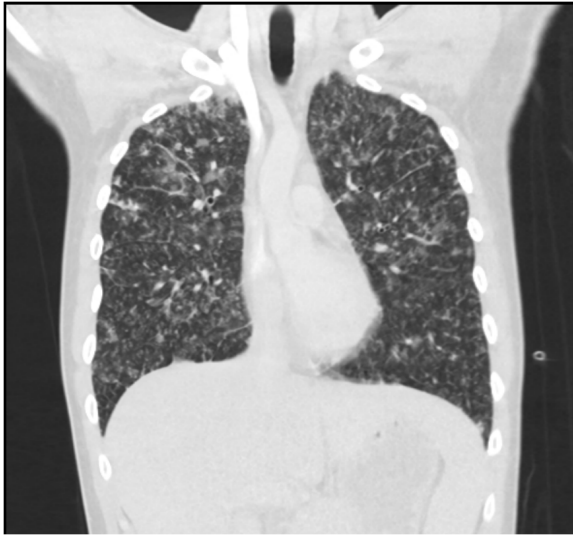
**Background.** *Battarrea* puffball mushrooms are found extensively worldwide and contain spore-containing sacs. Inhalation of the spores of similar mushrooms, such as *Lycoperdon*, have been implicated in cases of lycoperdonosis—a syndrome of hypersensitivity pneumonitis. We report a case of hypersensitivity pneumonitis confirmed to be secondary to *Battarrea* spore exposure diagnosed by broad-range PCR.

**Methods.** A 23-year-old homeless man with a history of methamphetamine use presented to the emergency department with a 2-week history of fevers, chills, productive cough, and malaise. He reported his symptoms began soon after eating a long-stemmed mushroom he found growing next to a building. He reported inhaling particles from the mushroom when he picked it up prior to eating it. He vomited within 1 hour of ingestion, and then had a worsening progression of cough and malaise over the following 2 weeks. In the emergency department, he was noted to have leukocytosis and mild elevation of transaminases. He required supplemental oxygen due to hypoxemia. CT scan of his chest demonstrated extensive bilateral nodular pulmonary infiltrates. He was admitted and started on treatment for community-acquired pneumonia. Over the next several days, he had worsening respiratory failure, and routine work up for infectious etiologies was unrevealing. To further investigate, bronchoscopy and bronchoalveolar lavage (BAL) was performed and routine bacterial, fungal and mycobacterial cultures and cytology with Gomori Methanamine-silver and acid-fast stains were negative. BAL fluid was sent for broad range DNA testing by PCR. Antibiotic therapy was stopped, and he was started on steroids to treat presumed hypersensitivity pneumonitis. He recovered rapidly and was discharged on a course of oral corticosteroids.

**Results.** After the patient was discharged, molecular testing of BAL fluid resulted with detection of *Battarrea* species DNA using 28s and ITS primer sets. DNA from no other pathogens was detected.

**Conclusion.** Identified through broad range DNA PCR testing, exposure to *Battarrea* mushroom spores may be a previously unreported cause of hypersensitivity pneumonitis. PCR testing should be considered in the workup of hypersensitivity pneumonitis with known or suspected exposure to mushroom spores.





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### 282. Epidemiology of Candidemia in Patients with Solid Tumors of the Gastrointestinal Tract

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**Background.** The Gastrointestinal (GI) tract is considered as an important source of candidemia. Numerous studies indicate that the majority of patients with candidemia and cancer have an underlying solid tumor mostly of the GI tract. Widespread use of antifungal prophylaxis among patients with selected hematological malignancies resulted in a proportional redistribution of the frequency of candidemia among patients with various malignancies, but the incidence of candidemia among patients with GI solid malignancies is unknown.

**Methods.** A retrospective chart review of patients diagnosed with GI malignancies from 2010 to 2018 at Rochester Regional Health, Lipson Cancer Institute was conducted, and the incidence of candidemia was determined.

**Results.** A total of 2783 patients with GI malignancies were analyzed. Fifty-six percent were males, and a mean age was 67 years. Sites of malignancy included large intestine ( $n = 1269$ ), pancreas ( $n = 394$ ), any part of the mouth and associated organs ( $n = 282$ ), liver and biliary system ( $n = 273$ ), stomach ( $n = 235$ ), esophagus ( $n = 135$ ), small intestine ( $n = 110$ ), and others ( $n = 85$ ). Over the period of review, total mortality was 49%. Only 0.7% ( $n = 19$ ) patients developed candidemia, with a total of 22 events. Nine episodes of candidemia happened prior to diagnosis of cancer, and 13 episodes developed after or at the time of diagnosis. There was no commonality in GI solid malignancy site among patients with candidemia. *C. albicans* was the most common isolate (9 episodes), followed by *C. parapsilosis* (8), *C. glabrata* (3), and *C. dubliniensis* (2). At the same time, there were 273 episodes of bacteremia in 230 patients (8%).

**Conclusion.** In our study candidemia among patients with GI solid-organ malignancies was very rare.

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### 283. Potentially Achievable Hepatitis A Vaccination Coverage with Simultaneous Administration of Vaccines Among Young Children in the United States

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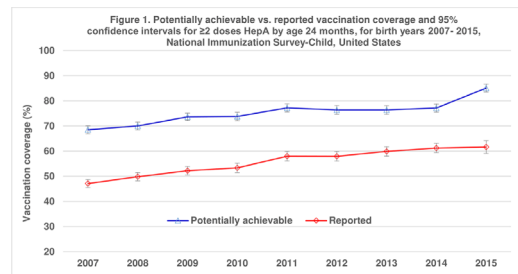
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**Background.** The Advisory Committee on Immunization Practices recommends simultaneous administration of all age-appropriate doses of vaccines. We estimated the vaccination coverage for  $\geq 2$  doses of hepatitis A vaccine ( $\geq 2$  HepA) that could have been achieved if opportunities for simultaneous administration with other recommended childhood vaccines had not been missed.

**Methods.** We analyzed National Immunization Survey-Child data for 2008–2017 in the United States. We defined potentially achievable  $\geq 2$  HepA coverage by age 24 months as the possible coverage if opportunities for simultaneous administration with other age-appropriate doses of vaccines for children by age 24 months had not been missed. We compared potentially achievable vaccination coverage to reported  $\geq 2$  HepA vaccination coverage by birth years 2007 to 2015. For children born in 2015, we stratified estimates by state and by selected socio-demographic factors. Both potentially achievable and reported  $\geq 2$  HepA coverage were evaluated using a Kaplan–Meier survival procedure to account for censoring of vaccination status.

**Results.** Compared with reported vaccination coverage, potentially achievable coverage for  $\geq 2$  HepA was at least 10 percentage points higher across birth years 2007 to 2015 and would have surpassed the 85% target of Healthy People 2020 for children born in 2015 (Figure 1). For the 2015 birth cohort, potentially achievable  $\geq 2$  HepA coverage exceeded the 85% Healthy People 2020 target in ten states (Figure 2). In addition, potentially achievable vaccination coverage was higher than reported coverage across all selected socio-demographic factors, with differences ranging from 20.1 percentage-points (private insurance only) to 31.7 percentage-points (non-Hispanic Black) (Table 1).

**Conclusion.** Potentially achievable coverage with  $\geq 2$  HepA consistently exceeded reported coverage for children from nine recent birth cohorts and across all selected socio-demographic characteristics. Coverage could increase substantially if missed opportunities were eliminated. Evidence-based interventions such as establishment of standing orders, use of provider reminders, and use of immunization information systems are recommended to increase HepA coverage among young children.



Note: The average change in vaccination coverage per annual birth year with % (95% CI): For Reported coverage: 1.92 (1.63, 2.20),  $P < 0.001$ ; For Potentially achievable coverage, 1.60 (1.07, 2.13),  $P < 0.001$ .