The Current State of Medical Mycology Laboratory Practice in Ghana: Preliminary Data from a FIKI Ghana and GMMG Survey

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Introduction/Background

Invasive fungal infections lack pathognomonic features, making their diagnosis very challenging. A combination of conventional methods and recent non-culture assays ensures rapid and accurate diagnosis. Data on availability of these techniques and assays as well as training of laboratory personnel in fungal diagnostics in Ghana are unknown

Methodology

An online questionnaire was administered to various laboratory facilities across the country on enquiring about the equipment, human resource, techniques and assays available for fungal diagnosis and management.

Discussion

IFI is increasing due to the ever-expanding risk population. The exact burden of IFI in Ghana remain unknown due to the present diagnostic challenges as a result of inadequate awareness. This survey is the first attempt in Ghana and gives an outlook of the current state of medical mycology laboratory practices in the country. Similar surveys have been conducted in some countries to report on status on mycology laboratory practice. Only a handful of laboratories had a designated mycology bench or had personnel with formal training in diagnostic mycology. Emergence of new pathogens and antifungal resistance is growing threat globally, but unfortunately specie identification and antifungal susceptibility testing was performed in only one of the labs surveyed. Non-culture assays offer rapid diagnosis and ensures prompt initiation of antifungal therapy. However, none of these assays are presently performed locally in the all labs surveyed. Furthermore, therapeutic drug monitoring, critical in giving specific antifungal drugs are not available.

Results

Between July 2020 and February 2021, we received 11 responses out of 15 questionnaires administered. Participating institutions were from the 3 geographical zones of Ghana. The distribution of institutions is, quaternary (1), tertiary (3), secondary (3 public and 3 private) and private laboratory (1). Only 4/11 laboratories had a designated bench or room for mycology while 4/11 had no BSLII hood. Personnel from 63% of centres have not received any additional training in mycological techniques post-qualification. Most of the labs (7/11) received less than 10 samples per week for fungal investigations. Dermatological samples were the commonest (11/11) and rarely blood (2/11) for cryptococcal antigen (CrAg) testing (1/2) and culture (2/2), CSF (5/11) for Indian ink (4/5) and CrAg (1/5) or biopsy (1/11). Direct microscopy was performed with KOH (11/11) and Indian ink (4/11). Fungal culture was available in two tertiary hospitals and the private medical laboratory. Antifungal susceptibility testing was only available in the private laboratory for yeasts with fluconazole using the disc diffusion method. No laboratory performed antigen-antibody, molecular or therapeutic drug monitoring tests. The private laboratory outsourced their CrAg to its partner laboratory in South Africa.

Table 1. **Summary of fungal test menu available in medical laboratories in Ghana**

Test	Availability (N=11)
Direct microscopy	
KOH	11/11 (100%)
Indian ink	4/11 (36.3%)
Calcofluor white	0/11 (0%)
Fungal Culture	3/11 (27.3%)
Fungal identification	0/11 (0%)
Antifungal susceptibility testing	1/11 (9.1%)
Fungal antigen-antibody testing	
Cryptococcal antigen and/or titre	1/11 (9.1%)
Aspergillus galactomannan	0/11 (0%)
Aspergillus specific antibodies	0/11 (0%)
Histoplasma galactomannan	0/11 (0%)
Candida mannan	0/11 (0%)
Beta D-glucan	0/11 (0%)
Fungal PCR	0/11 (0%)
Therapeutic drug monitoring	0/11 (0%)

Conclusion and Key Recommendation

This survey highlights significant gaps in laboratory diagnostics, training, and clinical suspicion of fungal infections. This emphasizes the need for efforts to increase awareness, diagnostic capacity and training.

References

1.Brown GD, Denning DW, Gow NA, Levitz SM, Netea MG, White TC. Hidden killers: human fungal infections. Science translational medicine. 2012 Dec 19;4(165):165rv13-.
2.Ocansey BK, Pesewu GA, Codjoe FS, Osei-Djarbeng S, Feglo PK, Denning DW. Estimated burden of serious fungal infections in Ghana. Journal of Fungi. 2019 Jun;5(2):38.
3.Chindamporn A, Chakrabarti A, Li R, Sun PL, Tan BH, Chua M, Wahyuningsih R, Patel A, Liu Z, Chen YC, Chayakulkeeree M. Survey of laboratory practices for diagnosis of fungal infection in seven Asian countries: An Asia Fungal Working Group (AFWG) initiative. Medical mycology. 2018 Jun 1;56(4):416-25.

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