

Burden of serious fungal infections in Zambia

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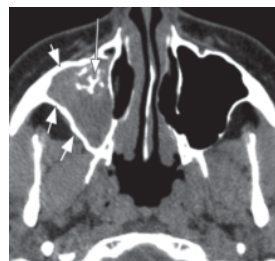
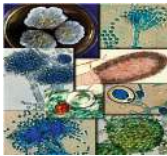


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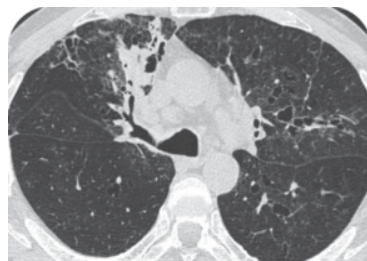


Background and rationale

Human fungal infections contribute substantially to morbidity and mortality. With an increase in prevalence and incidences of immunosuppressive conditions such as HIV in Zambia, the incidence is expected to be rising. To date, there is paucity of data on epidemiology of fungal infections in Zambia. We estimated the burden of fungal infections in Zambia based on published literature and modelling.



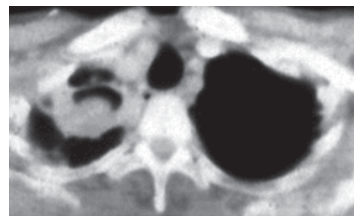
Aspergillus fumigatus



Central bronchiectasis in ABPA



Fungal keratitis



CPA

Methods

All published epidemiology papers reporting fungal, TB or HIV infection rates from Zambia were identified. We also extracted reported data from the WHO, UNICEF, USAID, UNAIDS, Centre for Infectious Disease Research in Zambia (CIDRZ), Central Statistical Office (CSO), Ministry of Health (MOH), Tropical Diseases Research Centre (TDRC) & Centre for Disease Control and Prevention (CDC). Where no data existed, we used specific populations at risk and fungal infection frequencies to estimate national incidence or prevalence. Data for invasive mycoses, CPA, IA, ABPA, Asthma and COPD rates were made on assumptions based on incidence rates reported in the local and international literature.

Results

- Population 13 million (2010), male: female=1:1.3, median age 16.5 yrs, 46.3% (0-14 yrs old), 2.4% >65yrs old.
- HIV/AIDS - adult prevalence rate 13.5% (~ 980,000) of which 598,000 are ARVs naive (2010).
- Estimated annual CM cases ~ 920 and ~2,990 PCP cases (ARV naive HIV+).
- TB prevalence (including HIV+TB) is 47,000, rate 352 /100,000 population. TB incidence (including HIV+TB) is 60,000, rate~ 444 / 100 000 populations with about 9,000 (23.6%) cases in HIV negative people.
- 5 year period prevalence CPA cases ~22,500 and 4,500 new cases in 2011 (assuming 50% of CPA cases are TB related).
- Adult asthma prevalence ~910,000 (7% population), 22,750 ABPA cases (2.5% adult asthmatics), severe asthma prevalence ~45,500 (5% asthmatics) and 27,300 SAFS cases (assuming 60% fungal sensitisation in severe asthma).
- Oral candidiasis 539,000 (55.1% of HIV+), vaginal candidiasis 174,525 (5% women >15 yrs old).
- No data: burden of candidemia, IA, mucormycosis and histoplasmosis.

Table: Estimated burden of fungal disease in Zambia

Fungal condition	Number of infections per underlying disorder per year 2010					Total burden	Rate /100K
	None	HIV/AIDS	Respiratory	Cancer/Tx	ICU		
Oesophageal candidiasis	-	4,035	-	-	-	4,035	31
Candidaemia	-	50	-	-	500	550	4
Candida peritonitis	-	5	-	-	100	105	2
RVC (4x/year +)	174,525	-	-	-	-	174,525	2,685
ABPA	-	-	22,750	-	-	22,750	175
SAFS	-	-	27,300	-	-	27,300	210
CPA	-	-	22,500	-	-	22,500	173.3
IA	-	-	-	?	?	?	?
Mucormycosis	-	-	-	?	-	?	?
CM	-	920	-	-	-	920	7.1
PCP	-	2,990	?	?	-	2,990	230
Histoplasmosis	?	?	?	-	-	?	?
Fungal keratitis	?	-	-	-	-	-	?
Tinea capitis	250,000	-	-	-	-	250,000	1923
Total burden estimated	816,271	8,000	72,550	0	600	897,421	

ABPA = Allergic bronchopulmonary aspergillosis, CM = Cryptococcal meningitis, PCP = Pneumocystis jirovecii pneumonia, IA = Invasive aspergillosis, CPA = Chronic pulmonary aspergillosis, RVC = Recurrent vaginal candidiasis, SAFS = Severe asthma with fungal sensitisation.

Conclusion

- More than 424,524 people in Zambia are estimated to suffer from serious fungal infections each year.
- Substantial uncertainty surrounds these estimates due to lack of enough epidemiological data.
- Therefore, epidemiological studies are urgently required to validate or modify these estimates.