

Burden of Serious Fungal Infections in the Czech Republic

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Objectives

We have estimated the number of serious fungal infections in order to define the burden of these diseases in the Czech Republic.

Methods

All published epidemiology papers reporting Czech fungal infection rates were identified¹⁻⁵. Where no data existed, we used specific populations at risk and fungal infection frequencies in those populations to estimate national incidence or prevalence, depending on the condition. Population statistics were obtained from the 2011 Census data⁶, number of critical beds⁷ and numbers of chronic obstructive pulmonary disease (COPD) and asthma cases in 2012 were derived from the Institute of Health Information and Statistics⁸. The 2012 HIV/AIDS^{9,10} and tuberculosis cases⁸ were obtained from the State Institute of Public Health, transplant cases from the Czech Transplant Coordination Centre¹¹, and cystic fibrosis cases from the European Cystic Fibrosis Society¹².

Results

85% of the 10.5 M population are adults, 15% are children below 14 years. There are 4.6 M women over 15 years of age, of whom 45% are over 50 years of age. Fungal disease burden estimates are: 152,840 Czech women get recurrent vaginal thrush¹³.

Of the 552 cases of tuberculosis in 2012, 23 new cases of chronic pulmonary aspergillosis (CPA) the 5-year period prevalence is 73 cases are estimated. As total CPA cases in COPD are more frequent, 365 total CPA cases are estimated. Reported adult asthma prevalence is ~2% and assuming 2.5% of asthmatics have allergic bronchopulmonary aspergillosis (ABPA), 5,216 patients with ABPA¹⁴ are likely and 6,842 more with severe asthma with fungal sensitisation (SAFS). Of the 1,619 estimated HIV positive patients the annual incidence of Pneumocystis pneumonia is 0.13/100,000 consistent with 13 cases⁹. The Pneumocystis pneumonia burden in immunosuppressed non-HIV population is presumed to be three to four times higher³. In HIV infection, oesophageal candidiasis is estimated to occur in 131 cases^{9,10}.

The rate of candidemia is estimated to 5/100,000 population¹⁵ consistent with 525 cases, along with 79 cases of Candida peritonitis among more than 70,000 abdominal surgeries a year⁷. Invasive aspergillosis in immuno-compromised patients is estimated at 343 cases annually^{4,5} including 206 cases in critical care^{16,17}, many with COPD.

There have been 637 cases of tinea capitis and/or corporis notified, but may be underrepresented, as this not notifiable disease¹⁸.

Conclusion

Using local data and literature estimates of the incidence or prevalence of fungal infections, nearly 170,000 (1.7%) people in the Czech Republic suffer from severe fungal infection each year. These figures are dominated by recurrent vaginitis, followed by allergic respiratory conditions. Substantial uncertainty surrounds these estimates except for invasive aspergillosis in haematology^{4,5} and candidaemia in critical care^{1,2}, where population based surveillance studies have been recently presented. Therefore, epidemiological studies are urgently required to validate or modify these estimates.

Infection	Number of infections per underlying disorder per year					Total burden	Rate /100K
	None	HIV/AIDS	Respir.	Cancer/T x	ICU		
Oesophageal candidiasis	-	131	?	?	-	131	1.25
Candidaemia	-	-	-	368	185	525	5
Candida peritonitis	-	-	-	-	79	79	0.75
Recurrent vaginal candidiasis (4x/year)	152,840	-	-	-	-	152,840	2,908*
ABPA	-	-	5,216	-	-	5,216	49
SAFS	-	-	6,842	-	-	6,842	65
Chronic pulmonary aspergillosis	-	-	365	-	-	365	3.48
Invasive aspergillosis	-	-	-	137	206	343	3.27
Mucormycosis	-	-	-	12	-	12	0.12
Cryptococcal meningitis	-	<5	-	-	-	-	-
Pneumocystis pneumonia	-	13	?	39	-	52	0.52
Tinea capitis/corporis	637	-	-	-	-	637	6.06
Total burden estimated	153,477	144	12,423	556	430	167,030	

* Rate per 100,000 women

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