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Mycology: Fungal infections

Burden of serious fungal infections in Russia

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Objectives.
The incidence and prevalence of fungal infections in Russia is unknown. We estimated the burden of fungal infections in Russia according to methodology of the LIFE program.

Methods.
The bases for the computations have been adopted from previously published literature [1,2]. Population and hospital data were obtained from Federal State Statistics Service of the Russian Federation [3]. HIV/AIDS data were obtained from World Health Organization (WHO) and Ministry of Health of the Russian Federation [4,5]. Transplant data of 2011 were obtained from Russia Society of Blood and Marrow Transplantation [6].

Results.
Russia population was estimated to be 142 900 000 million people (2011), with 15% children (0-14 years) and 21% over 60 years old.
Based on the 67 317 newly diagnosed HIV/AIDS patients in 2011 with the assumption that 0,44% of HIV/AIDS patients present with cryptococcal meningitis, the burden of cryptococcal meningitis was estimated at 0,21/100 000. The burden of *Pneumocystis jirovecii* pneumonia was estimated at 5,65/100 000. There were 60 585 patients with oral candidiasis (42,2/100 000) and 13 463 patients with oesophageal candidiasis per year (9,42/100 000).
Invasive aspergilosis in haematological malignancy were estimated to affect 320 patients, assuming an attack rate of 10% in AML, and overall in immunocompromised patients was estimated at 387 patients, and 2851 cases in COPD admissions with a combined rate of 2,27/100 000. We used AML data in Russia to estimate of 232 cases of mucormycosis (0,162/100 000).
The adult asthma population was estimated at 7 million. Using a 2.5% rate of adult asthma patients + 15% of adults with cystic fibrosis [2], prevalence of allergic bronchopulmonary aspergillosis is 122,52/100 000 and severe asthma with fungal sensitization – 161,65/100 000.
In 2011 there were 94 297 new cases of pulmonary tuberculosis reported. We estimated the prevalence of chronic pulmonary aspergillosis is 126,19/100 00, using the formula proposed by Denning [1], and assuming TB accounted for 33% of cases.
The rate of invasive candidiasis was estimated as 0,37/1000 hospitalized patients per year. In 2011 there were 9919 patients with candidaemia (6,94/100 000) and 1921 patients with *Candida* peritonitis (1,34/100 000).
Assuming 5% of adult women have recurrent *Candida* vaginitis, there were 2 072 679 women in Russia with this disease (2900,88/100 000). In 2011 were reported about 60 366 patients with tinea capitis (*Microsporun canis* – 40,8/100 000, *Trichophyton* spp. – 1,8/100 000) including 47 092 children.

Conclusion. According to our estimation, 1,88% of Russia population have serious fungal diseases. Nationwide epidemiological studies are needed.

References:
1. Denning D.et al, Bull World Health Organ. 2011;89:864-72
2. Denning D.et al, Med Mycol. 2013;51(4):361-70
3. Federal State Statistics Service of the Russia http://www.gks.ru/
4. http://www.who.int/tb/country/data/profiles/en/index.html
5. https://www.rosminzdrav.ru/docs/mzsr/stat/46
6. http://www.transpl.ru/

Table 1. Estimated burden of fungal disease in Russia

Burden of Fungal Infection	Number of infections per underlying disorder per year					Total Burden	Rate/ 100K
	None	HIV/ AIDS	Respiratory	Cancer/ Immuno-compromised	ICU/ abdominal surgery		
Cryptococcal meningitis	-	296	-	-	-	296	0,21
Pneumocystis pneumonia	-	8078	-	-	-	8078	5,65
Invasive aspergillosis	-	-	2851	387	-	3238	2,27
Chronic pulmonary aspergillosis	-	-	52311	-	-	52311	126,19
Allergic bronchopulmonary aspergillosis (ABPA)	-	-	175082	-	-	175082	122,52
Severe asthma with fungal sensitization	-	-	231000	-	-	231000	161,65
Candidemia	9919	-	-	-	-	9919	6,94
Candida peritonitis	-	-	-	-	1921	1921	1,34
Oral candidiasis	-	60585	-	-	-	60585	42,40
Oesophageal candidiasis	-	13463	-	-	-	13463	9,42
Recurrent Candida vaginitis (> 4/year)	2072679	-	-	-	-	2072679	2900,88
Mucormycosis	-	-	-	-	-	232	0,162
Fungal keratitis	?	-	-	-	-	-	?
Tinea capitis total: Trichophyton Microsporum canis Tinea capitis children: Trichophyton Microsporum canis	-	-	-	-	-	60366 2495 57871 1479 45613	 1,8 40,8 6,9 213,1
Total serious fungal infection burden						**2 689170**	**1882**