Report from the AMRSN-Antimicrobial Resistance Surveillance Network; data from 2013 to 2017 spanning four geographically distant tertiary care hospitals in India

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Objectives:

Establish “Antifungal Resistance” in India.
Monitor trends in fungal species distribution, susceptibility landscapes, creation of a national database and eventually establish guidelines on combating the spread of antifungal resistance in India.

Methods: This multicentre study was initiated in 2013 and is ongoing. Four tertiary care centres are collaborating centres.
Clinical details and the yeasts isolated were collected.
All the yeasts were identified by MALDI-TOF and some by DNA Sequencing.
Antifungal susceptibility testing was performed as per broth microdilution technique of CLSI M27 protocol.
Interpretation of the breakpoints were done as per the recent guidelines.

Resistance pattern for three most common antifungals in use

Conclusion: The spectrum of *Candida* species causing invasive infections has expanded. *W. anomalous* is emerging as an agent of invasive candidiasis and is seen as third most common yeast. Fluconazole and caspofungin resistance to *C. tropicalis*, is of concern. Fluconazole resistance with *C. albicans* is as per earlier rates but increasing trend of resistance to voriconazole and caspofungin has been noted. *C. glabrata* had low fluconazole resistance.

Resistance patterns among various yeast species isolated during the network study

		MIC/MEC			% by category	
Species (Total)	Antifungal Tested	Range	50%	90%	S	R
C. tropicalis (954)	Amphotericin-B	0.03-8	0.5	1	97.6	2.4
	Caspofungin	0.03-16	0.12	0.5	93.9	6.1
	Anidulafungin	0.02-4	0.03	0.12	98.8	1.2
	Micafungin	0.02-16	0.12	0.25	98.4	1.6
	Fluconazole	0.03-64	0.5	4	93.5	6.5
	Voriconazole	0.03-4	0.06	0.25	97.2	2.8
	Posaconazole	0.03-16	0.12	0.25	99.4	0.6
	Itraconazole	0.03-8	0.5	0.12	98.4	1.6
C. albicans (546)	Amphotericin-B	0.03-2	0.5	1	98.2	1.8
	Caspofungin	0.03-64	0.12	0.5	96.0	4.0
	Anidulafungin	0.02-4	0.03	0.12	98.7	1.3
	Micafungin	0.02-2	0.12	0.12	98.7	1.3
	Fluconazole	0.03-64	0.25	2	93.2	6.8
	Voriconazole	0.03-16	0.03	0.5	93.4	6.6
	Posaconazole	0.03-8	0.12	0.5	99.1	0.9
	Itraconazole	0.03-16	0.12	0.5	95.8	4.2
W. anomalus (259)	Amphotericin-B	0.03-1	0.5	1	100.0	Nil
	Caspofungin	0.03-4	0.25	0.5	94.6	5.4
	Anidulafungin	0.03-2	0.03	0.12	97.7	2.3
	Micafungin	0.03-2	0.12	0.25	97.3	2.7
	Fluconazole	0.12-64	2	4	96.9	3.1
	Voriconazole	0.03-1	0.12	0.5	99.6	0.4
	Posaconazole	0.03-16	0.25	1	98.8	1.2
	Itraconazole	0.03-1	0.25	0.5	97.7	2.3
C. krusei (241)	Amphotericin-B	0.03-4	1	1	82.6	7.9
	Caspofungin	0.03-8	0.25	1	85.9	14.1
	Anidulafungin	0.03-4	0.12	0.5	95.0	5.0
	Micafungin	0.03-4	0.12	0.5	95.0	5.0
	Fluconazole	0.12-64	8	16	42.3	57.7
	Voriconazole	0.03-8	0.25	0.5	98.3	1.7
	Posaconazole	0.03-0.5	0.25	0.5	100.0	Nil
	Itraconazole	0.03-1	0.25	0.5	97.5	2.5
C. parapsilosis (187)	Amphotericin-B	0.03-2	0.5	1	98.4	1.6
	Caspofungin	0.03-16	0.5	2	99.5	0.5
	Anidulafungin	0.03-8	0.5	2	99.5	0.5
	Micafungin	0.03-4	0.5	2	100.0	Nil
	Fluconazole	0.12-64	0.5	4	92.0	8.0
	Voriconazole	0.03-4	0.03	0.25	98.9	1.1
	Posaconazole	0.03-4	0.06	0.25	99.5	0.5
	Itraconazole	0.03-4	0.12	0.25	97.9	2.1
C. glabrata (177)	Amphotericin-B	0.12-8	0.5	1	96.0	4.0
	Caspofungin	0.03-4	0.12	0.5	82.5	17.5
	Anidulafungin	0.02-4	0.06	0.12	97.7	2.3
	Micafungin	0.03-1	0.12	0.12	91.0	9.0
	Fluconazole	0.12-64	1	8	98.3	1.7
	Voriconazole	0.03-8	0.12	1	88.7	11.3
	Posaconazole	0.03-8	0.25	0.5	97.7	2.3
	Itraconazole	0.03-2	0.25	0.5	94.4	5.6