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Antimicrobial activity of carbol fuchsin dye: Is there Efficacy against *Candida albicans*?

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To the Editor

Candida albicans (*C. albicans*) developed resistance to multiple antibiotics recently, making them difficult to treat with standard therapies. So using alternative strategies such as dyes to treat *C. albicans* is urgent [1-3].

Strong carbol fuchsin (SCF) is a red-colored dye commonly used in histology to stain biological tissues and microorganisms. SCF has a high affinity for acidic structures such as nucleic acids and polysaccharides, making it useful for staining cell nuclei and cartilage [4-6].

In the current study, *C. albicans* isolated from 30 positive culture patients from three sites (vagina, oral, and urine) and cultured in sabouraud dextrose agar and confirmed by germ tube test. The well diffusion method used to evaluate the activity of SCF and diluent carbol fuchsin (DCF) stains as well as disc diffusion method after overnight incubation for antibiotic sensitivity test of fluconazole 25 µg as control agents; the diameter of the inhibited growth is measured in millimeter. All the statistical analysis was done by using SPSS 26 software.

From a total of 30 candida albicans isolates, 80% were sensitive to fluconazole (S ≥ 19 mm). 100% of isolates were sensitive to SCF (S> 13 mm). DCF showed 100% resistance to candida albicans [Figure 1].

The inhibition zone of fluconazole 19.53± 4.04 mm was near the inhibition zone of SCF 19.17± 2.37 mm with no significant differences (P= 67) [Table 1].

According to the site of infection, SCF showed low activity against isolates from urine specimens 17.5± 1.6 mm compared to isolates from both vagina 19.92± 2.35 mm and oral cavity 19.60± 2.45 mm with significant differences.

On the another hand, fluconazole revealed low efficacy against isolates from vagina 16.5± 4.83 mm compared to both oral cavity 22.30± 1.33 mm and urine 20.63± 0.91 mm with high significant differences [Table 2].

No correlation was observed between SCF and fluconazole (r= 0.11, P= 0.55) [Table 3].

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Table 1: Comparison inhibition zone mean in both fluconazole and strong carbol fuchsin

Antibiotics	N	Mean	Std. Deviation	P value
Fluconazole	30	19.53	4.04	0.67
strong carbol fuchsin	30	19.17	2.37	

Table 2: Antifungal activity of agents according to the site of infection

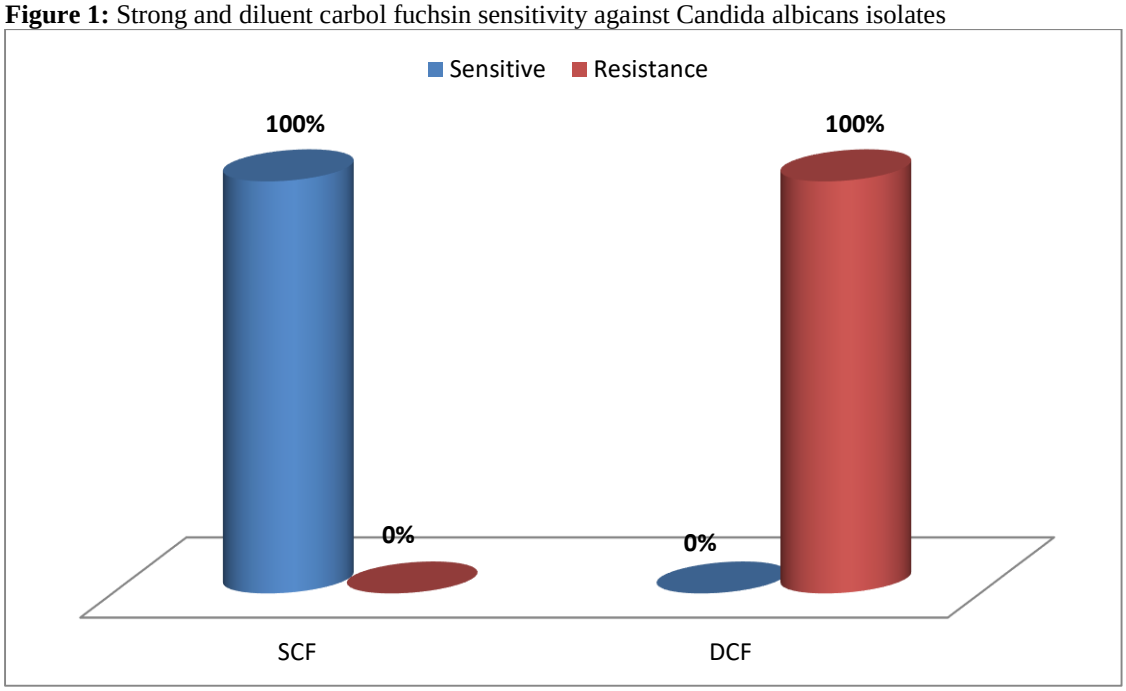
Variables	N	Means (mm)	SD	Significance*
SCF				
Vaginal swab	12	19.92	2.353	a
Oral	10	19.60	2.459	a
Urine	8	17.50	1.604	b
Total P value	0.06			
FLU				
Vaginal swab	12	16.50	4.834	a
Oral	10	22.30	1.337	b
Urine	8	20.63	0.916	b
Total P value	0.001			

*The same letters mean there are no significant differences, while different letters mean there are significant differences.

Table 3: Correlation between SCF and fluconazole

Variables		SCF	FLU
SCF	Correlation		.112
	Sig. (2-tailed)		.555
	N	30	30
FLU	Correlation	.112	
	Sig. (2-tailed)	.555	
	N	30	30

Figure 1: Strong and diluent carbol fuchsin sensitivity against Candida albicans isolates



Conclusion

Strong carbol fuchsin activity is superior to fluconazole efficacy against C. albicans with 100% activity. It is promising to be used in clinical practices.

Conflict of interest:

None.

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