Hospital Infection Control

Bactericidal Effect of Disinfectant Medilox®

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April, 1998

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Purpose

This research was carried in order to evaluate sterilization effect of a Super-oxidized water, Medilox solution developed by Soo San ENC, Co. Ltd against hospital germs.

Method

In order to purely separate test strains, it was inoculated on Sabouruad dextrose agar and incubated for one night. *Candida* spp was inoculated on Sabouruad dextrose agar and incubated for 48 hours at 30℃

Test strains was dissolved in saline water and the standard impurity degree was set to Mcfarland 0.5(10/ml). Bacillus spp. was set McFarland 1.0 and *Candida* spp was set to Mcfarland 2.0.

0.1ml of mixture of microorganisms was added and mixed into 10ml of Medilox. Control solution was used 10ml of normal saline instead of Medilox.

After 30 seconds, 1 minutes, 3 minutes, 5 minutes, 0.2ml of the mixed microorganisms and Medilox was blended into 10ml of Brain-Heart Infusion broth.

0.1ml of this mixed solution was inoculated on Sabouruad dextrose agar and incubated for one night at 37℃. Candida spp was inoculated to Sabouraud dextrose agar and incubated for 48 hours at 30℃.

After germs were proliferated on Sabouruad dextrose agar, number of strains was measured. The available chlorine in Medilox solution was 40 ppm.

Results

1. ATCC Clinical isolates

Test organism	Survivor count per ml				
	Initial count	0.5min	1min	3min	5min
Staphylococcus aureus ATCC 29213	3.2×10^6	< 10	< 10	< 10	< 10
Escherichia coli ATCC 25922	2.0×10^6	< 10	< 10	< 10	< 10
Enterococcus faecalis ATCC 29212	3.2×10^6	< 10	< 10	< 10	< 10
Pseudomonas aeruginosa ATCC 27853	3.0×10^6	< 10	< 10	< 10	< 10
Staphylococcus aureus SNUH 7148	3.6×10^6	< 10	< 10	< 10	< 10
Excherichia coli SNUH 47310	3.2×10^6	< 10	< 10	< 10	< 10
Enterococcus faecalis SNUH 46251	4.0×10^6	< 10	< 10	< 10	< 10
Pseudomonas aeruginosa SNUH 46229	2.0×10^6	< 10	< 10	< 10	< 10

2. Methicillin-resistant *Staphylococcus aureus* (MRSA)

Test organism	Survivor count per ml				
	Initial count	0.5min	1min	3min	5min
MRSA SNUH 6124	4.4×10^6	< 10	< 10	< 10	< 10
MRSA SNUH 7135	6.3×10^6	< 10	< 10	< 10	< 10
MRSA SNUH 7136	4.5×10^6	< 10	< 10	< 10	< 10
MRSA SNUH 7191	5.0×10^6	< 10	< 10	< 10	< 10

3. *Salmonella*와 *Shigella*

Test organism	Survivor count per ml				
	Initial count	0.5min	1min	3min	5min
Salmonella sp. Group A	1.1×10^6	< 10	< 10	< 10	< 10
Salmonella sp. Group D	8.2×10^6	< 10	< 10	< 10	< 10
Shigella flexneri	8.2×10^6	< 10	< 10	< 10	< 10
Shigella boydii	6.4×10^6	< 10	< 10	< 10	< 10
Shigella sonnei	5.6×10^6	< 10	< 10	< 10	< 10

4. *Bacillus* spp.

Test organism	Survivor count per ml				
	Initial count	0.5min	1min	3min	5min
Bacillus cereus ATCC 11778	1.0×10^6	< 10	< 10	< 10	< 10
Bacillus cereus SNUH 5123	0.6×10^6	< 10	< 10	< 10	< 10
Bacillus alvei	0.2×10^6	< 10	< 10	< 10	< 10
Bacillus circuluns	0.2×10^6	< 10	< 10	< 10	< 10
Bacillus thuringinsis	0.5×10^6	< 10	< 10	< 10	< 10

5. *Candida* spp.

Test organism	Survivor count per ml				
	Initial count	0.5min	1min	3min	5min
Candida albicans SNUH 3993	2.1×10^6	< 10	< 10	< 10	< 10
Candida albicans SNUH 3995	0.8×10^6	< 10	< 10	< 10	< 10
Candida albicans SNUH 316213	1.0×10^6	< 10	< 10	< 10	< 10
Candida albicans SNUH 316219	0.8×10^6	< 10	< 10	< 10	< 10
Candida albicans SNUH 316221	0.9×10^6	< 10	< 10	< 10	< 10
Candida albicans SNUH 316226	0.9×10^6	< 10	< 10	< 10	< 10
Candida lropicalis SNUH 316217	0.6×10^6	< 10	< 10	< 10	< 10
Candida glabrata SNUH 316228	1.4×10^6	< 10	< 10	< 10	< 10

Conclusion

According to this experiment, Medilox solution had an effect against not only general microorganisms but also clinical isolates such as *Salmonella* or *Shigella*. It also had a sterilization effect against MRSA causes hospital infection. Under 40 ppm density for 30 seconds exposure, it showed a sterilization effect against spore-forming *Bacillus* and *Candida*.

<Notes> <10: means detection limit in research institute. That is no germs were detected.

SNUH: Seoul National University Hospital

ATCC: American Type Culture Collection