

«Halo» phenomenon (phenomenon “Stefanis”) in relation with antimicrobial copper implementation

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Antimicrobial
Copper Cu⁺



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“HALO” PHENOMENON

The antimicrobial activity of copper alloys extends in a decreasing way within over 50cm and its' percentage ranging from 75 to 79.3%.

The microbiocidal properties of copper were able to confer an 'antimicrobial halo' within the general vicinity of the arm top in that the microbial burden associated with the wooden side arms of the copper covered chair arms was significantly lower, 70%, than the control.*

*M.G. Schmidt Copper Surfaces Reduce the Microbial Burden in an Out-Patient Infectious Disease Practice Med. Univ. of South Carolina, Charleston, SC, Copper Dev. Association, New York, NY

Aim

The aim of this study was to evaluate the antimicrobial action of copper alloys in the form of a 'circle' (“halo” phenomenon), resulting in a further reduction of microbial loads in non antimicrobial copper implemented multi-touch surfaces.

Method - Material

In a Neonatal Intensive Care Unit (NICU) with the capacity of 26 beds (boxes) of a paediatric hospital implemented with antimicrobial copper Cu⁺ (Cu+63% Zn - 37%, Low Lead) and certified for the antimicrobial activity of objects and surfaces, samples and cultures were taken within 50cm distance from the Cu⁺ implemented objects and surfaces, in order to measure the microbial flora. This process took place the period before, during and 2 months after Cu⁺ implementation. Parameters such as Operational Protocols and staffing of the NICU during the research were not differentiated.



Results

The reduction of microbial load on multi-touch surfaces of Cu⁺ was recorded at 90%, and at a distance of 50 cm from the Cu⁺ implemented objects or surfaces the reduction of microbial loads (cfu / ml) was recorded at a rate of 75-79.3% (N = 36 - P = 0.005 < 0,05). Microbial strains found were: Klebsiella spp., Staph. Epidermidis, Staph. Aureus, Sphingomonas paucimobilis.

RESULTS I

The bacteria isolated on touch surfaces and objects before and after copper implementation													
Control Points		Klebsiella spp.			Staph. Epidermitis			Staph. Aureus			Enterococcus spp.		
		Before copper's implementation	One month after copper's implementation	Five months after copper's implementation	Before copper's implementation	One month after copper's implementation	Five months after copper's implementation	Before copper's implementation	One month after copper's implementation	Five months after copper's implementation	Before copper's implementation	One month after copper's implementation	Five months after copper's implementation
1	Entrance door push plate	70000	0	0	100000	20000	10000	0	0	0	0	0	0
2	Window hatch dirty linen	0	0	0	50000	10000	0	80000	0	0	0	0	0
3	Surface of infants' table	100000	0	0	100000	10000	10000	0	0	0	0	0	0
4	Hangers of serum	0	0	0	80000	10000	10000	0	0	0	40000	0	0
5	Handles of closets	0	0	0	50000	0	0	0	0	0	0	0	0
6	Surface of trolley	100000	0	0	80000	0	0	0	0	0	0	0	0
7	Chief-nurse's office surface	0	0	0	100000	10000	0	0	0	0	0	0	0

n=21, p=0.031<0,05, Statistics SPSS18

RESULTS II

The bacteria isolated on control points (touch surfaces and objects) where copper was not implemented													
Control Points		Klebsiella spp.			Staph. Epidermitis			Staph. Aureus					
		Before copper's implementation	One month after copper's implementation	Five months after copper's implementation	Before copper's implementation	One month after copper's implementation	Five months after copper's implementation	Before copper's implementation	One month after copper's implementation	Five months after copper's implementation	Before copper's implementation	One month after copper's implementation	Five months after copper's implementation
1	Entrance door push plate	70000	0	0	0	0	0	0	0	0	0	0	0
2	Window hatch dirty linen	0	0	0	60000	0	10000	80000	0	0	0	0	0
3	Surface of infants' table	100000	0	0	60000	0	0	0	0	0	0	0	0
4	Incubator (50cm away from infants' table)	70000	0	0	60000	0	0	0	0	0	0	0	0
5	Incubator (50cm away from trolley)	10000	0	0	40000	10000	0	0	0	0	0	0	0

n=15, p=0.005 < 0,05, Statistics SPSS18

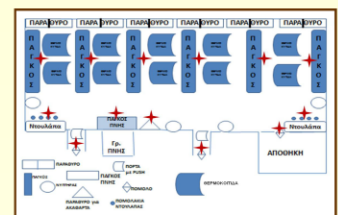
Conclusions

The recorded 'radial action' of the Cu⁺ alloys in a circular form (“halo” phenomenon) provides further confirmation of copper's antimicrobial ability. The «halo» phenomenon enables Cu⁺ to reduce microbial flora and increase its beneficial effects on health sector and sets the bases for further comparative



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Copperized items



Copper Alloys Radial Action

