Differences in mite survival in blankets washed in top-loading vs. front-loading washing machines

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Introduction

Blankets and clothing are reservoirs of dust mites and mite allergens, and thus require frequent washing. Water at 140ºF kills mites by scalding[1], but with cold or warm-water washing many mites die simply by drowning[2]. Previous studies of the effect of hot- and cold-water washing on the removal of dust mites from blankets used top-loading washing machines[3,4], in which the machine's tub is filled with water, and the bedding remains submerged while being agitated. In contrast, many newer washing machines are water-conserving front-loaders, in which the item is repeatedly wetted and spun, without it staying submerged in water. We studied whether the type of machine used for washing affects the number of mites removed from blankets.

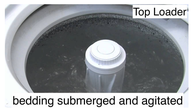
Methods

Sections of polyester blankets were inoculated with dense cultures of *D. pteronyssinus* mites and then vacuumed. They were separated into unwashed controls or washed in a top-loading (Kenmore 80 Series) or a front-loading (Asko W6424) washing machine, in hot water (125ºF at the faucet, 115ºF in the tub for top-loading; 140ºF front-loading) or in cold water, or in cold water with a non-bleach oxidizer. After air-drying, the live mites remaining in each section were counted using the Heat Escape method.

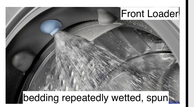
Results

Hot-water washing reduced mean mite numbers by 78% (p=.03) in the top loader, and 90% (p=.01) in the front-loader. Cold-water washing reductions were 65% (p=.05) top-loader, but only 10% (p=.78) front-loader. Adding a non-bleach oxidizer to cold washes had no significant effect on surviving mite numbers in either machine.

	TOP LOAD				FRONT LOAD			
	Controls	Hot	Cold	Cold + Oxy	Controls	Hot	Cold	Cold + Oxy
Mean mites/cm^2	126	28	44	44	126	12	113	69
		p = .55				p = .008		
	p = .03				p = .01			
	p = .05				p = .78			
			p = .04					



Heat Escape Method Mite Counting Grids



Conclusions

Front-loading washing machines, in which items are not totally submerged in water, are less effective than top-loading washing machines at removing mites from blankets using cold water.

When washing blankets with a front-loading, high-efficiency washing machine, hot water should be used to remove dust mites.

(Alternatively, mites can be killed by 10 minutes of heat in a clothes dryer prior to washing.[5,6])

References

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