

Comparative efficacy of commercial combs in removing head lice

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Introduction:

The use of a fine comb for removing lice from the head of the human host is a relevant tool both in the diagnosis of infestations and as part of an integrated control strategy of head lice. The effectiveness of a fine comb depends, in part, on the design and material they are built. The aim of this study was to compare the efficacy of metal and plastic combs that are currently used in the removal of head lice and their eggs worldwide.

Methods:

KSL® plastic and metal combs, KSL Consulting (Helsingør, Denmark). NOPUCID® plastic comb, ELEA S.A. (Argentina). ASSY® metal comb purchased in an Argentinean market (Fig. 1). The assays were performed comparing the combs in pairs: KSL® vs. NOPUCID® plastic combs, KSL® vs. ASSY® metal combs, and KSL® plastic comb vs. ASSY® metal comb. A total of 1,243 children (6–12 years old) were examined, and children infested with more than ten head lice (n=50) were included in the study. The hair was divided in bilateral halves, and each half was randomly assigned to each comb of the pair to be evaluated. For each one, we combed ten times: four from the forehead to the neck, three in reverse, and three from the region behind the ears toward the centre of the head. The design assumes homogeneous distribution of lice on each half of the same head. The Wilcoxon matched pairs test was used to compare the efficacy of the combs of each pair.

Results:

Table 1 KSL® vs NOPUCID® plastic combs

^a Number of studied infested heads
^b Number of heads from which instars were collected

Stage	Lice removed (n=16) ^a				P value
	KSL® comb		NOPUCID® comb		
	Mean ± SD (n) ^b	Total	Mean ± SD (n) ^b	Total	
Nymph I	1.50 ± 1.1 (4)	6	0.25 ± 0.4 (4)	1	0.068
Nymph II	2 ± 1.1 (4)	8	1.50 ± 1.1 (4)	6	0.583
Nymph III	2.10 ± 1 (9)	19	0.55 ± 0.7 (9)	5	0.007
Adult	3.25 ± 3.7 (16)	52	3 ± 2.1 (16)	48	0.88
Total eggs	1.33 ± 0.5 (6)	8	0.50 ± 0.7 (6)	3	0.138
Hatched eggs (nits)	1.33 ± 0.5 (6)	8	0.50 ± 0.7 (6)	3	0.138

The combs removed more adults than nymphs or eggs. KSL® removed more individuals of all stages (SD for NIII). All the eggs removed were hatched.

Table 2 KSL® vs ASSY® metal combs

^a Number of studied infested heads
^b Number of heads from which instars were collected

Stage	Lice removed (n=13) ^a				P value
	KSL® comb		ASSY® comb		
	Mean ± SD (n) ^b	Total	Mean ± SD (n) ^b	Total	
Nymph I	1.33 ± 2.3 (9)	12	3.44 ± 2.5 (9)	31	0.075
Nymph II	1.37 ± 1.0 (8)	11	4.37 ± 2.77 (8)	35	0.029
Nymph III	1.88 ± 2.1 (9)	17	2.22 ± 1.92 (9)	20	0.520
Adult	6.30 ± 5.29 (13)	82	4.61 ± 3.5 (13)	60	0.195
Total eggs	6.07 ± 6.69 (13)	84	61.92 ± 70.5 (13)	867	0.0009
Hatched eggs (nits)	2.35 ± 3.57 (13)	32	23.42 ± 22.31 (13)	328	0.001

The combs removed more eggs than mobile stages. ASSY® removed more individuals of all stage, except adults (SD for NII and eggs).

Table 3 The best plastic comb (KSL®) vs the best metal comb (ASSY®)

^a Number of studied infested heads
^b Number of heads from which instars were collected

Stage	Lice removed (n=21) ^a				P value
	KSL® comb (plastic)		ASSY® comb (metal)		
	Mean ± SD (n) ^b	Total	Mean ± SD (n) ^b	Total	
Nymph I	0.83 ± 2.2 (12)	10	3.66 ± 3.54 (12)	44	0.03
Nymph II	1.0 ± 0.9 (5)	5	2.6 ± 1.2 (5)	13	0.108
Nymph III	1.0 ± 1.7 (12)	12	2 ± 1.47 (12)	24	0.114
Adult	4.0 ± 5.9 (18)	72	4.83 ± 5.34 (18)	87	0.717
Total eggs	0.85 ± 2.4 (21)	18	19.52 ± 24.9 (21)	410	0.0001
Hatched eggs (nits)	0.33 ± 1.1 (21)	7	12.85 ± 15.04 (21)	270	0.0001

The ASSY® metal comb removed more individuals of all stages (SD for NI and eggs).

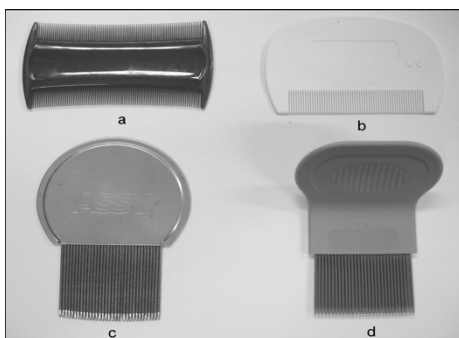


Fig. 1
a) NOPUCID® plastic comb, b) KSL® plastic comb, c) ASSY® metal comb, d) KSL® metal comb

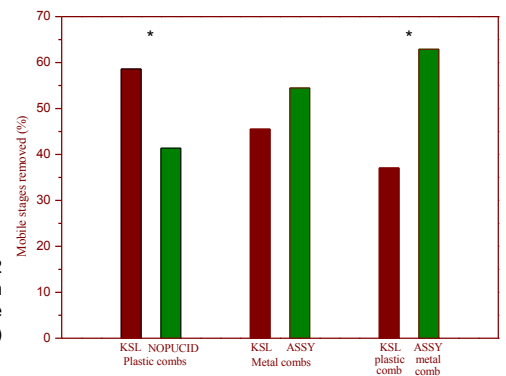


Fig. 2
Mobile stages removed in each treatment group. Asterisks indicate significant differences (p < 0.05)

Conclusions:

In conclusion, the most effective plastic comb was KSL®, removing a higher number of individuals of all stages. The most effective metal comb was ASSY®, removing more insects of all stages (except adults). The comparative test between KSL® plastic and ASSY® metal showed that ASSY® was the most effective in removing head lice and their eggs.