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Efficacy and Safety Meta-analysis of Professional At-Home Tooth Whitening

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Objectives: This analysis was conducted to systematically evaluate the clinical effectiveness and safety of 12 professionally dispensed (at-home) peroxide based whitening systems. **Methods:** A meta-analysis was conducted using an inclusive dataset from 15 randomized clinical trials that had common entrance criteria and methods. Effectiveness was measured objectively as $L^*a^*b^*$ color change on maxillary teeth using digital image analysis. Treatments varied with respect to form of peroxide (carbamide peroxide or hydrogen peroxide), peroxide concentration & dose, daily regimen, total days of use, and delivery (tray or strips). All products tested in the research were professionally-dispensed for use at-home. Some studies included more than one test product. Subject level data were pooled and adjusted mean color improvements were estimated for each study & product using a general linear model adjusting for age and baseline color. **Results:** The pooled sample included 413 subjects (18-67 years of age) who were treated. Baseline b^* color ranged from 12.8 to 23.3, and baseline L^* color ranged from 67.1 to 80.8. The overall weighted average (SD) for Δb^* and ΔL^* of the combined sample was -2.0 (1.46) and 2.1 (1.39), respectively. In the Δb^* and ΔL^* general linear models, age and baseline color were each significant factors ($p < 0.008$) relating to the tooth color improvement. The professionally dispensed at-home products had adjusted means for Δb^* and ΔL^* ranging from -0.5 to -4.7 and 1.1 to 4.1 , respectively, depending on peroxide concentration, daily contact time, and total number of days treated. Tooth sensitivity (25%) and oral irritation (22%) occurred most frequently with approximately 1% of subjects discontinuing treatment due to these events. **Conclusion: Whitening response with professionally dispensed systems varied depending on peroxide concentration, daily contact time, and total days of treatment with an overall low occurrence of side effects.**