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CHUTIMA WIRANIDCHAPONG : EVALUATION OF SUN
PROTECTION FACTOR OF SUNSCREEN PRODUCTS IN THAI
VOLUNTEERS. THESIS ADVISOR : PANVIPA KRISADAPHONG Ph.D.,
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The sun protection factor (SPF) of selected commercial sunscreen products which were either imported or locally made, was evaluated with Thai volunteers using both the in vivo and in vitro methods. The in vivo method was based upon the US-FDA and COLIPA procedures whereas the in vitro method was based upon the work of Diffey and Robson employing the SPF-290 analyzer. In the US-FDA method, the SPF of standard homosalate was found to be well within the requirement. Thus, this in vivo SPF evaluation was adhered to the US-FDA standard procedures. In the COLIPA method, the SPF of low SPF standard (DIN) was found to be only slightly different from the required SPF. However, the SPF of high SPF standard (CTFA, SPF 15) was found to be much lower than the required SPF when tested in Thai volunteers with different skin types from typical volunteers with type I and type II skins. However, the in vivo SPF data of sunscreen products obtained from the COLIPA method showed positive correlation with the data obtained from the US-FDA method ($r=0.9982$) and the evaluated SPF values from both methods showed no statistically significant difference at a 95% confident interval. It is quite obvious from this study that the evaluated in vivo SPF values of high SPF products, i.e., products with SPF 15, 19, 20 and 30 with Thai volunteers were lower than claimed values. The in vitro SPF data also correlate quite well with the in vivo SPF data obtained by the US-FDA and COLIPA methods ($r=0.6488$ and 0.6767 , respectively). The results clearly indicated that the in vitro SPF data obtained from the SPF-290 analyzer represent reasonable preliminary data for further in vivo experiments. One important consideration needs to be made in claiming the SPF of particular sunscreen products available in the Thai market. That consideration focuses on the careful conduct of the in vivo SPF evaluation with adequate numbers of Thai volunteers and in several laboratories in order to obtain reliable SPF values which are representative values for Thai consumers.