Effect of Facial Expression of Mother on 15–21-Month-Old Infants Using Salivary Biomarker

Akiko Tange[*], Megumi Mino, Kiyoshi Miyazawa,
Kazuo Hiraki[1], Syohji Itakura[2] and Masaki Yamaguchi[3]

Unicharm Corporation, Japan
[1]Developmental Cognitive Neuro-Science, Cognitive Information Analysis,
The University of Tokyo, Japan
[2]Department of Graduate School of Letters, Kyoto University, Japan
[3]Graduate School of Engineering, Iwate University, Japan

The objective of this study is to determine the possibility of evaluating stressful events such as facial expressions of mothers in linguistically incommunicable infants using salivary alpha-amylase (sAMY) activity. Eleven healthy Japanese infants between 15 and 21 months old were enrolled. Both a smile and grimace of their own mothers were shown to the subjects for 1 min as a stressor. sAMY activity in the infants was analyzed using a sAMY monitor before and after exposure to the stressors. Both facial expressions and behaviors of the subjects were recorded using a video camera and then the data were analyzed using a behavior coding system. Furthermore, the emotions of the subjects during the test period were subjectively evaluated by their mothers using a visual analogue scale (VAS). A significant correlation was observed between the mothers and the infants in terms of psychological state evaluated using the behavior coding system ($p < 0.01$, correlation coefficient (R) was 0.81). The sAMY activity during the grimace exposure was significantly higher than that during the smile exposure ($p < 0.05$). However, a correlation between VAS score and sAMY activity was observed ($p < 0.05$, $R = -0.26$). It was indicated that salivary biomarkers may be used for evaluating noninvasively the stressful events experienced by infants .

[*]Corresponding author: e-mail: akiko-tange@unicharm.com