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Investigation of the impact of skin lesions on perception of beauty and assignment of personality traits

Abstract

Skin lesions localized in visible body areas have proven negative impact on the patient's quality of life. People with skin changes are assessed as less attractive, whereas many aspects of their personal and professional life are judged worse in comparison to healthy skin humans. However, it is still unknown what effect on perception of beauty and assignment of personality traits have hemangiomas located in various facial regions. There is also no information presenting what changes occur in eye gaze patterns during the observation of the faces with hemangiomas as well as healthy skin faces depending on the observer's age, sex and educational level. There are also unknown disparities in eye movements patterns between fee-observation that is not associated with additional task and face observation associated with assessment of facial attractiveness.

Research objectives:

1. Analysis of the eye movements during the healthy skin female faces observation.
2. Analysis of the eye gaze patterns during the observation of female faces with hemangiomas in different locations.
3. Investigation of the impact of locations of facial hemangiomas on assessment of attractiveness and five personality traits: intelligence, self-confidence, trustworthiness, kindness and dominance.
4. Assessment of the number of fixations made by female and male study participants during the healthy skin female faces observation.
5. Assessment of the impact of observer's age, sex and educational level on differences in eye gaze patterns during the observation of the healthy skin female faces as well as faces with hemangiomas in various locations.
6. Analysis of the observers' eye gaze patterns during the free-observation and observation associated with the facial attractiveness assessment.

Study group consisted of 98 patients of General Practitioner Practice, who viewed pictures of healthy skin female faces as well as with hemangiomas in different facial regions. The experiment was conducted with the use of the eye-tracker allowing to follow observer's eyes movements and the questionnaire to assess facial attractiveness and five analyzed personality traits. For the purpose of detailed analysis study participants were divided into two gender groups, three age groups (18-40, 41-59, ⩾60 years) and two educational level groups (lower and higher).

Results:

1. When looking at the healthy skin female face perceivers focused significant amount of visual attention on the central facial triangle including eyes, nose and mouth of presented faces.
2. When viewing female faces with hemangiomas, study participants presented the following eye movements patterns. We found that hemangioma was observed as the first area and with the longest fixation duration among the other analyzed facial regions, thus both conditions were met, only in case of perioral hemangioma location. Hemangioma on the lower nose attracted participant's initial visual attention. Presence of the hemangioma on the right lower eyelid as well as on the forehead resulted in longer observation of the area covering or being closest to the skin lesion.
3. Female faces with hemangioma, irrespectively of the abnormality location, were assessed as being less attractive, intelligent, self-confident, trustworthy, kind and dominant than healthy skin female faces. The outcomes suggest that hemangiomas located closely to the typically observed central facial triangle (including eyes, nose, mouth) as well as in the middle of the forehead have a more negative impact on perception of facial beauty than skin lesions located peripherally on the face (namely on the cheek, near the eyebrow and on the side of the forehead). The lowest ratings of attractiveness and self-confidence among all analyzed locations of skin lesion obtained faces with hemangioma on the right lower eyelid. We reported improvement in the 5 perceived character traits in faces without skin changes and with peripherally located hemangiomas in comparison to faces with hemangiomas in the central facial areas, and the differences were significant.

4. The outcome of the eye-tracking variables analysis did not find significant difference in number of fixations between male and female participants during the healthy skin female face observation.
5. There are statistically significant differences in the eye movements patterns performed by study participants divided on the basis of their age, sex and educational level when gazing on the pictures of female faces without skin lesions and with hemangiomas. Hemangioma on the right lower eyelid attracted visual attention of the participants aged between 18 and 40 stronger than of participants at the age of 60 and older. Females paid more visual attention to perioral area in healthy skin faces and with hemangioma on the left side of the lower nose when compared to males. Study participants with lower education level have a greater tendency to relocate their visual attention from the central facial triangle to hemangiomas located peripherally (near the left eyebrow, in the middle of the forehead, on the right cheek) than observers with higher educational level.
6. Eye movements during the free observation of female faces differ significantly from gaze patterns observed during the facial attractiveness assessment. Hemangiomas within the central facial triangle, specifically on the nose and mouth, were regions of higher visual attention during the judgement task in comparison to free observation. Whereas hemangiomas located peripherally from the central facial triangle did not attract observer's visual attention during the attractiveness judgements and then visual attention to the area of the nose increased during the attractiveness assessment when compared to the free observation.

To the present time and to our knowledge, this is innovative study using eye-tracking technology and questionnaires to better understand how humans' perception of adult females with facial hemangiomas changes with a modification only of the skin lesion localization. The results suggest that facial hemangiomas negatively affect perception of females and thus women may benefit from an appropriate disfigurement treatment resulting in improvement of assessed beauty and personality. Positive changes in one's perception may also facilitate social interactions when a good first impression is of paramount importance. Presented results might be used in practice by physicians involved in the treatment of patients with facial imperfections and might be used as an indication for taking into account, during

the treatment plan development, not only medical indications but also location of the lesions and individual preferences of the patients.