GLOBAL SKIN HEALTH

NEW INSIGHT INTO THE LINK BETWEEN SKIN MICROBIOTA AND POLLUTION DERIVED CLINICAL DISORDERS

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Introduction: Recent data has demonstrated a link between small pollution-derived particulate matter (PM2.5) exposure and the appearance of pigment spots and wrinkles within a Chinese population, consistent with the body of literature associating pollution with the early manifestation of skin aging. PM2.5 contains an assortment of reactive chemicals such as polycyclic aromatic hydrocarbons (PAHs), which upon exposure to UVA demonstrate a pronounced increase in toxicity. Additionally, emerging data has suggested a link between increased skin microbiome diversity and aging.

Objective: The present study aimed the explore the association between pollution exposure, skin microbiota and skin clinical signs within a Chinese cohort from two cities of different average pollution levels.

Materials and Methods: Microbiome samples were collected from the cheeks of women from Baoding (high-pollution city HP, n=102) and Dalian (low-pollution city LP, n=102), subsequently utilizing bacterial 16S rRNA gene and fungal ITS1 amplicon and shotgun sequencing, followed by bioinformatics and statistical analyses. We assessed skin clinical skin parameters (acne, wrinkles, pigment spots) within the same participants.

Results: Our data demonstrate a strong association between pollutant exposure and skin microbiota diversity. HP city samples were enriched in particular sub-species of Cutibacterium acnes genera with depollution potential. Shotgun sequencing further revealed that genes encoding pollutant-degrading enzymes were approximately ten times more prevalent in HP city samples. Additionally, correlation analysis with clinical parameters indicated: i) the association of specific bacterial group with acne in the HP exposed

subjects; ii) the correlation of spread macules and forehead wrinkles with higher bacterial diversity (MW(pval)=0.0171 and 0.0065).

Conclusion: These data demonstrate the association between pollutant exposure and a disequilibrium in the skin microbiota, which in turn could influences the skin clinical conditions and account for pollution-induced declines in skin quality.