Diabetes Mellitus and Glucose Metabolism

DIABETES COMPLICATIONS II

Tear Glands and the Diabetic Patient: Is It a Biomarker?

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MON-704

Background: Tear glands in the eyelids, meibomian glands, play a role in tear film production and tear film stabilization. Diabetic patients often complain of dry eye and eye pain. Recently, there are new infrared (820nm) photography techniques to image meibomian glands easily in patients.

Purpose: To study meibomian glands in diabetic patients with dry eye.

Methods: A retrospective chart review (2017-2019) of Type 2 Diabetes Mellitus (T2DM) patients and non-diabetic patients with the diagnosis of "dry eye" in EHR (eClinicalworks, Westborough, MA) was performed. Infrared eyelid imaging (820 nm wavelength, Heidelberg Spectralis, Heidelberg, Germany) was taken. T2DM: Inclusion criteria: 1) HbA1c of > 5.7% who also had infrared eyelid imaging performed + 4 weeks of their HbA1c lab test results; 2) the percentage loss of meibomian glands for each eye, then averaged, for each patient. Control: Inclusion criteria: 1) non-diabetic patients; 2) HbA1c lab test results; 3) infrared eyelid imaging was performed; 4) percentage loss of meibomian glands was calculated for each eye, then averaged per patient. Exclusion criteria for both T2DM and Controls: younger than the age of 18 years old, older than 90 years old, no glaucoma topical medications, no eyelid surgery, no corneal surgery, no conjunctival surgery.

Results: n=120 patients, Avg Age=69.6 years (sd=15.1, range 23-89 years). Diabetic patients: n=60 patients, Male=30, Female=30, Avg Age=65.1 years (sd=11.50, med=65.5, range 36-85 years). Controls: n=60 patients, Male=37, Female=23, Avg Age=54.1 years (sd=16.4, med=56.5, range 23-89 years). Meibomian gland loss: Diabetics=51.54%, Controls=11.29% ($p<0.0001$, t-test). Of the 60 DM patients: 35/37pts with HbA1c > 6.6% had greater loss of meibomian glands (>40%), compared to 12/23 DM patients with HbA1c < 6.5%, $p=0.0001$.

Discussion: Loss of meibomian glands in diabetic patients have been recently investigated; however, its relationship to HbA1c as a possible biomarker has not been widely discussed in literature. In this small study, loss of meibomian glands occur more frequently with elevated HbA1c, perhaps due to microischemia of the eyelids, thereby resulting in loss of meibomian glands.

Conclusion: Loss of meibomian glands may suggest a need for HbA1c testing and further monitoring of the patient's diabetic condition. Infrared imaging of the eyelid may be useful in characterizing dry eye in diabetic patients.

Pediatric Endocrinology

PEDIATRIC PUBERTY, TRANSGENDER HEALTH, AND GENERAL ENDOCRINE

Baseline Body Satisfaction in Gender-Diverse Youth

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SUN-079

Baseline Body Satisfaction in Gender-Diverse Youth

Background: Body dissatisfaction often contributes to the distress experienced by transgender and nonbinary individuals. However, limited data exist regarding body image in the pediatric age range.

Objective: To establish baseline ratings of body satisfaction among gender-diverse youth prior to puberty blocking medication.

Methods: Subjects were recruited from the gender health clinic at Riley Hospital for Children beginning in January 2018. Eligible subjects met clinical criteria for a puberty blocker, were treatment naïve, and were anticipated to be on a blocker alone for ≥ 1 year. We assessed self-reported body satisfaction at baseline using the Body Image Scale-Gender Spectrum. Subjects rated various body parts on a scale of 1 (very satisfied) to 5 (very dissatisfied). For analysis, body parts were grouped into gendered features (primary sex, secondary sex, & neutral characteristics) and also body areas (appearance/hair/voice, head & neck, musculoskeletal, hips, chest, & genitals/gonads).[1]

Results: Twenty subjects (mean age 12.0, range 8.4-14.0) were enrolled of whom 13 were transmasculine (TM) and 7 were transfeminine (TF). TM subjects had a mean BMI percentile of 73.7% and height z-score of 0.50, with breast Tanner stage (TS) of II (n=2), III (n= 3), IV (n=3) and V (n=4). Estradiol levels ranged from <20-120 pg/mL and testosterone levels ranged from <10-38 ng/dL. TF subjects had a mean BMI percentile of 65.3% and height Z-score of 0.58, with testicular volumes of 5 cc (n=1), 6 cc (n=2), 9 cc (n=1), 10 cc (n=1) and 15 cc (n=1). Testosterone levels ranged from <10-215 ng/dL and estradiol levels ranged from <5-31 pg/mL. Among all subjects, mean satisfaction ratings for gendered features were 4.45 (primary sex characteristics), 3.21 (secondary sex characteristics), and 2.61 (neutral characteristics). Mean satisfaction ratings for body areas were 4.45 (genitals/gonads), 3.85 (chest), 3.23 (appearance/hair/voice), 3.03 (hips), 2.83 (musculoskeletal), and 2.55 (head & neck). The only significant between-group difference in satisfaction was for the chest region, with TM subjects reporting higher dissatisfaction (4.35 vs 2.93, $p<0.004$).

Conclusion: The gender-diverse youth in our study reported high degrees of dissatisfaction with their genitals/gonads and, for TM subjects, their chest. In contrast, they reported generally neutral feelings toward many of their other body parts. To the best of our knowledge this is the youngest cohort of gender-diverse youth in whom body satisfaction has been explored. Further studies of the effects of endocrine treatment on body image in gender-diverse youth are warranted, specifically as they relate to other measures of well-being.

References: 1. van de Grift TC et al. Body satisfaction and physical appearance in gender dysphoria. *Archives of sexual behavior.* 2016;45(3):575-585.