

Gender of growing importance in diabetes studies

July 20 2016, by Johannes Angerer

The international guidelines for the management of type 2 diabetes consider such factors such as age, social environment, the duration of the illness and associated health complaints. But gender is not included. This is becoming a significant issue because men and women have different risks and develop different types of diabetes; thus, the treatment should become more gender-specific and personalised.

This is the most important realisation of a review regarding the status of gender-specific differences tailored to this holistic extent, to which MedUni Vienna researchers Alexandra Kautzky-Willer and Jürgen Harreiter contributed. The review was published in *Endocrine Reviews*.

Genetic disposition and biomarkers in women and men

The facts clearly speak for a gender-specific consideration and treatment of type 2 diabetes, which affects approximately 600,000 Austrians. From a biological perspective, men are principally at a higher risk of developing [diabetes mellitus](#); women are "protected" for a while due to the increased levels of oestrogen until menopause causes a hormonal change and reduces this protection. In most cases, the risk for men is increased because they have a greater amount of stomach fat and more liver fat and a lower sensitivity to insulin, even if they are not overweight. The lack of testosterone in men is a risk factor, although women with higher levels of male sexual hormones are principally at a

higher risk.

"In contrast, it was shown that the thigh fat, which is more frequent in women due to genetics and oestrogen, can even have a protective effect. On the other hand, the stomach circumference in women has a better diabetes predictive power than in men," says Kautzky-Willer, diabetes expert and Austria's first professor for gender medicine. "In women, psychosocial stress, stress on the job and lack of decision-making competency at high performance pressure or lack of sleep more frequently lead to diabetes than in men. This is often also intensified due to weight gain." On the other hand, men are more at risk of developing diabetes at a later point in life if their mothers suffered malnutrition during pregnancy.

There are also gender-specific differences in the biomarkers, which can aid in the early detection of [diabetes risk](#). There are promising biomarkers for women, but not men, including the protein fetuin-A, produced by the liver; copeptin, a prohormone formed in the hypothalamus; and proneurotensin, a neurotransmitter. Here, the hormone leptin, which sends chemical messages to cease eating and to harvest energy from the reservoirs, such as fat depots, is a strong biomarker.

Environmental impacts as risk factors for diabetes

"Endocrine disruptors, meaning hormone-active substances, become increasingly important," says Jürgen Harreiter. Studies show that synthetically manufactured substances such as bisphenol A or phthalate (a softening agent), which are contained in many plastic items, are considered risk factors for diabetes. Depending on age, these have different effects in men and women.

There are also regional differences: More and more [women](#) in Oceania,

South and Central Asia as well as the Middle East are developing diabetes, whereas the illness affects more [men](#) in affluent areas of the Pacific-Asia region as well as Central Europe. In the future, the gender-specific factors of [diabetes](#) are to be incorporated in the praxis.

More information: Alexandra Kautzky-Willer et al. Sex and Gender Differences in Risk, Pathophysiology and Complications of Type 2 Diabetes Mellitus, *Endocrine Reviews* (2016). [DOI: 10.1210/er.2015-1137](#)

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