

Gestational diabetes: physical activity before pregnancy and its influence on the cardiovascular system

Sitzberger C. (1), Meyle K. (1), Wagner M. (1), Lienert N.(1), Graupner O. (3), Ensenauer R. (3,4), Lobmaier S. (5), Oberhoffer R. (1,2), Wacker-Gußmann A. (1,2)

(1) Institute of Preventive Pediatrics, Faculty of Sports and Sciences Technische Universität München, Germany

(2) German Heart Centre Department of Pediatric Cardiology and Congenital Heart Defects, Munich Germany

(3) Research Center, Dr. von Hauner Children's Hospital, Ludwig-Maximilians-Universität München, Munich, Germany

(4) Experimental Pediatrics, Department of General Pediatrics, Neonatology and Pediatric Cardiology, University Children's Hospital, Heinrich Heine University Düsseldorf, Düsseldorf, Germany

(5) Klinikum rechts der Isar, Department of Gynecology and Obstetrics, Munich, Germany

[The last two authors equally contributed to the manuscript]

Objectives: Gestational diabetes mellitus (GDM) is a common complication in pregnancy, affecting around 14% of all pregnancies each year. It will likely further increase, as obesity becomes more and more prevalent. The impact of GDM on cardiovascular changes in pregnant women and her child is still unclear. The aim of the study was to measure the effects of physical activity before pregnancy on the cardiovascular system in patients with gestational diabetes.

Methods: 206 pregnant women were included in this observational study. All participants were recruited in an obstetrical department between 28 - 32 weeks gestation. Questionnaires dealing with pre-pregnancy physical activity were evaluated. The cardiovascular status of the mother included measurements of the intima-media thickness of the carotid arteries (ALOKA prosound 6)

Results: 99 women with gestational diabetes, aged 33,84 (SD ± 4,7) years were examined. 107 healthy pregnant women, aged 32,6 (SD± 4,2) years served as controls. The mean weight in the study group was 73,0 (SD± 20, 3) kg and 61,7 (SD± 9,5) kg in the control group. Based on the higher weight in the study group, the BMI was also significantly higher than in the control group (26,3 (SD± 7,1 vs. 21, 6 ± 3; p=0,001). The frequency of physical activity was significantly higher in the control group (p = 0,001). Women who were physically inactive before pregnancy had a 3-times higher risk to develop GDM compared to active women (OR = 3,1). The intima media thickness (IMT) of the A. carotis interna was significantly thicker in the study group (0, 47 (SD± 0,004 mm vs 0, 44 (SD± 0,009) mm (p=0,006).

Conclusion: Physical activity and a lower initial weight reduces the risk of developing GDM in pregnancy. Further interventional studies are needed to evaluate these results.