

Gestational diabetes: Influence of Physical Activity on the mother and her newborn

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

(1) Institute of Preventive Pediatrics, Faculty of Sports and Health Sciences Technische Universität Munich, Germany;

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

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

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

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

[The last two authors equally contributed to the manuscript]

Objectives: Gestational diabetes has several effects on the cardiovascular health of the mother and her child. The aim of the study was to measure the impact of physical activity on the health of the mother and her newborn.

Methods: 206 pregnant women were examined in a prospective observational study. A 6-minute-walking-test was performed to evaluate the objective physical activity level. Questionnaires were used to evaluate the daily activities and the physical activities.

Results: Gestational diabetes was found in 99 patients, 107 patients served as healthy controls. Before pregnancy the study group had a significant higher Body -Mass -Index (26,3 vs. 21,6; $p < 0,001$) but gained less weight during pregnancy (11,5kg vs 14,9 kg vs., $p=0,001$).

The objective fitness level was worse in pregnant women with gestational diabetes compared to healthy controls (distance: 472 meters vs. 523 meters, $p = < 0,001$). Physical activity before and in pregnancy was less performed in the study group (86% vs. 64,5%, $p = 0,002$; 69% vs. 45,7%, $p = 0,003$). This corresponds to less daily activity in the study group (walking 69 minutes/day vs. 53 minutes/day, $p = 0,144$).

The birth weight in the study group was significantly higher than the control group ($p=0,018$), although both groups were within normal range. Length and head circumference were equal in both groups.

In the study group, above-average physical activity level resulted in a lower birth weight (3266g vs. 3449g, $p = 0,056$) compared to those with a below average activity level in the same group. The birth percentile was significantly lower in the above-average group (36,6 vs. 52,4, $p = 0,013$). Length and height didn't show any differences.

Conclusions: Physical activity seems to have a positive additional influence on birth weight in pregnancy with gestational diabetes and might help to optimize treatment. Further interventional studies are needed to prove these results.