



Women with Gestational Diabetes Mellitus do not have compromised polyunsaturated fatty acid status

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Pregnant women who develop pre-eclampsia (PE) and/or intra-uterine growth restriction (IUGR) have reduced polyunsaturated fatty acid (PUFA) status compared to healthy pregnancy⁽¹⁾. It is unknown if pregnant women diagnosed with Gestational Diabetes Mellitus (GDM), and their offspring, also have compromised PUFA status. To determine if women with GDM, and their offspring, have altered PUFA status compared to healthy pregnancy. Pregnant women were recruited from Glasgow Scotland, and Brisbane, Australia from antenatal clinics for this cross sectional study. Third trimester maternal blood samples were collected after an overnight fast and cord blood samples were collected at delivery. Plasma fatty acids were analysed using gas chromatography from women with GDM (n = 37) and healthy pregnancies (n = 27) and their respective offspring (n = 31, from women with GDM, and n = 27 from healthy women). T-tests were used to determine significant differences between maternal with GDM and healthy pregnancy, as well as for their offspring and significance was set at p<0.05. Previously, erythrocyte fatty acids were analysed from women with PE (n = 21), IUGR (n = 13) and healthy pregnancies (n = 86)⁽¹⁾. All results were expressed as mol percent of total fatty acids. There were no differences in maternal plasma arachidonic acid (4.51 ± 1.23 vs. 4.72 ± 0.64, p = 0.39) and plasma EPA & DHA (2.33 ± 0.74 vs 2.69 ± 1.04, p = 0.14) in women with GDM and healthy pregnancies, respectively. There were no differences in fetal plasma arachidonic acid (11.58 ± 2.26 vs. 12.63 ± 1.69, p = 0.08) and plasma EPA & DHA (4.44 ± 1.17 vs. 4.44 ± 1.00, p = 0.89) in offspring from women with GDM and healthy pregnancies, respectively. Women with PE and IUGR had approximately 25% lower erythrocyte EPA & DHA and 35% lower erythrocyte arachidonic acid compared to healthy pregnant⁽¹⁾. Offspring from women with PE and IUGR had approximately 25% lower erythrocyte EPA & DHA and 22% lower erythrocyte arachidonic acid compared to healthy pregnancy⁽¹⁾. Women with PE and IUGR had lower PUFA status likely due to reduced PUFA synthesis⁽¹⁾ and offspring from women with PE and IUGR had reduced PUFA status likely due to ectopic fat in placenta tissue⁽²⁾. Women with GDM do not have compromised PUFA status suggesting there is no reduced synthesis and transport of PUFA. Offspring from women with GDM do not have reduced PUFA status suggesting there is no problem with PUFA transport across the placenta, unlike offspring from women with PE and/or IUGR. Women with GDM, and their offspring, do not have compromised plasma PUFA status compared to healthy pregnancy.

Keywords: Gestational Diabetes Mellitus, Polyunsaturated Fatty Acids, Status, Omega-3 Index

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References

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