

Table G3.A11. Physical Activity Effects on Glycemic Control and Cardiovascular Disease Risk Factors in Type 1 Diabetes: Cross-Sectional Studies

Author, Year	Subject	Groups Correlation	Outcome(s) Assessed If Applicable	Findings, Main Results												
Ligtenberg et al., 1999 (1)	n=221 18-45 years No late complications	Correlation of HbA1c to physical activity Self-report questionnaire	HbA1c	No correlation between activity level and glycemic control												
Ligtenberg et al., 1999 (1)	n=221 18-45 years No late complications	Correlation of HbA1c to physical activity Self-report questionnaire	Insulin dose	More active people used lower insulin dose ($P=0.002$)												
Waden et al., 2005 (2) FinnDiane Study	n=1,030, T1D 482 male Mean age in 3 groups: Sedentary 37 years Moderately active, 37 years Active group: 38 years	Sedentary <10 METs/week Mod. active 10-40 METs/week Active >40 METs/week 12 months validated questionnaire	HbA1c	<p>HbA1c:</p> <p>Women</p> <table> <tr> <td>Sedentary</td> <td>8.8±1.4</td> </tr> <tr> <td>Moderately active</td> <td>8.3±1.4</td> </tr> <tr> <td>Active</td> <td>8.3±1.4</td> </tr> </table> <p>$P = 0.004$</p> <p>Men</p> <table> <tr> <td>Sedentary</td> <td>8.4±1.3</td> </tr> <tr> <td>Moderately active</td> <td>8.2±1.4</td> </tr> <tr> <td>Active</td> <td>8.2±1.3</td> </tr> </table> <p>$P = 0.844$</p> <p>In women—HbA1c improved, especially with greater frequency (9 – 8.4 – 8.2, $P = 0.008$), trended toward improvement with longer duration. Moderate better than both Low and High intensity.</p>	Sedentary	8.8±1.4	Moderately active	8.3±1.4	Active	8.3±1.4	Sedentary	8.4±1.3	Moderately active	8.2±1.4	Active	8.2±1.3
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Author, Year	Subject	Groups Correlation	Outcome(s) Assessed If Applicable	Findings, Main Results
Herbst et al., 2007 (3)	n=23,251, T1D	Correlation of physical activity to CVD risk factors Grouped into 3 groups: 0 x each week 1-2 x each week 3 or more	Times per week A1c, TG, Cholesterol, LDL, HDL, SBP(% elevated), DBP(% elevated)	A1c 0 8.1±1.9 1-2 7.8±1.6 3+ 7.8±1.6 P P <0.00001 TG 0 126±102 1-2 114±85 3+ 114±92 P P <0.00001 Cholesterol 0 181±48 1-2 178±45 3+ 176±38 P P <0.00001 LDL 0 99±35 1-2 96±35 3+ 95±32 P P <0.0001 HDL 0 61±19 1-2 63±9 3+ 63±17 P P <0.00001 SBP(% elevated) 0 8.4±28 1-2 7.5±26 3+ 8.6±28 P NS DBP(% elevated) 0 3.5±18 1-2 3.2±17 3+ 1.9±14 P P <0.0001

DBP, diastolic blood pressure; SBP, systolic blood pressure; CVD, cardiovascular disease; HDL, high-density lipoprotein; LDL, low-density lipoprotein; MET, metabolic equivalent task; Mod., moderate; T1D, type 1 diabetes; TG, triglycerides

Reference List

1. Ligtenberg PC, Blans M, Hoekstra JB, van dT, I, Erkelens DW. No effect of long-term physical activity on the glycemic control in type 1 diabetes patients: a cross-sectional study. *Neth.J.Med.* 1999 Aug;55(2):59-63.
2. Waden J, Tikkanen H, Forsblom C, Fagerudd J, Pettersson-Fernholm K, Lakka T, Riska M, Groop PH. Leisure time physical activity is associated with poor glycemic control in type 1 diabetic women: the FinnDiane study. *Diabetes Care* 2005 Apr;28(4):777-82.
3. Herbst A, Kordonouri O, Schwab KO, Schmidt F, Holl RW. Impact of physical activity on cardiovascular risk factors in children with type 1 diabetes: a multicenter study of 23,251 patients. *Diabetes Care* 2007 Aug;30(8):2098-100.