



# Association Between Handedness and Type 2 Diabetes: The E3N Study

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Some studies reported decreased longevity in left-handed individuals as compared with right-handed individuals without a clear underlying explanation. We examined the unexplored relationship between handedness and type 2 diabetes (T2D) among 65,732 women from the prospective Etude Epidémiologique auprès de Femmes de la Mutuelle Générale de l'Éducation Nationale (E3N) cohort study (1) between 1990 and 2008.

As compared with right-handed women, there was an increased risk of T2D in left-handed women (hazard ratio 1.21 [95% CI 0.96–1.53]) and a significantly increased risk in mixed-handed women (1.36 [1.17–1.57]) (Table 1). When both left- and mixed-handed women were grouped, the increased risk of T2D persisted (1.31 [1.16–1.49]). Adjusting for T2D risk factors had little impact on the estimations (model M<sub>1</sub>). Associations were decreased but remained significant when adjusting for BMI, suggesting alternative mechanisms (model M<sub>2</sub>). We have also shown that nonright-handedness was predictive of a higher incidence of obesity (1.19 [1.05–1.34], data not shown).

Some hypotheses could explain our results. Hand preference is influenced by cortex hemisphere dominance (2), which therefore could be involved in the development of T2D. Handedness formation is also related to prenatal

**Table 1—T2D risk according to handedness**

	T2D cases (n)	Model M <sub>0</sub>	Model M <sub>1</sub>	Model M <sub>2</sub>
<b>Handedness</b>				
Right-handed	2,410	1 (reference)	1 (reference)	1 (reference)
Left-handed	73	1.21 (0.96–1.53)	1.21 (0.96–1.52)	1.15 (0.91–1.45)
Mixed	195	<b>1.36 (1.17–1.57)</b>	<b>1.36 (1.17–1.57)</b>	<b>1.29 (1.11–1.49)</b>
<b>Handedness</b>				
Right-handed	2,410	1 (reference)	1 (reference)	1 (reference)
Left-handed or mixed*	268	<b>1.31 (1.16–1.49)</b>	<b>1.31 (1.16–1.49)</b>	<b>1.25 (1.10–1.41)</b>

Data are hazard ratios (95% CI). E3N cohort study population (N = 65,732 women). M<sub>0</sub>, univariate model. M<sub>1</sub>, M<sub>0</sub> + adjusted for family history of diabetes, school level, physical activity, hypertension, and smoking. M<sub>2</sub>, M<sub>1</sub> + BMI. Values in boldface type indicate P < 0.05. \*Some of the mixed-handed individuals may have been born left-handed and their handedness has switched.

testosterone exposure (3), which is predictive of T2D development in women (4). Even though we considered self-reported handedness, this is the first study to highlight a relationship between hand preference and T2D risk. These findings deserve further explorations.

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the study and takes responsibility for the integrity of the data and the accuracy of the data analysis.

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