

December 10, 2002

Matching Results for Ancillary Study #132:

A Prospective Study of Genetic and Biochemical Predictors of Type 2 Diabetes Mellitus

Case Selection:

All locally adjudicated cases of incident Diabetes Mellitus (DM) among White, Black, Hispanic, and Asian participants were selected as cases from the August 31, 2002 database from the WHI Observational Study. Both self report and medication use was used to classify a participant as having incident diabetes. The following mixes of these report methods determined eligibility:

Medication Use	Self - Report		
	<i>Yes</i>	<i>No</i>	<i>Missing</i>
<i>Yes</i>	Eligible Case	Eligible Case	Eligible Case
<i>No</i>	Not Eligible	Not Eligible	Not Eligible
<i>Missing</i>	Eligible Case	Not Eligible	Not Eligible

A potential case was then excluded if they possessed any of the following characteristics:

- Baseline Glucose \geq 126 mg / dl (only available for about 1% of the participants)
- Inadequate Baseline Blood and DNA Supply
- Baseline CVD (Defined as having a MI, Angina, Stroke, or CHF)
- Refusal to participate in a genetic study
- Confirmed No Antidiabetics Usage at AV-3 (for those participants who report incidence diabetes prior to AV-3)
- Baseline Diabetes

Out of an original 2,785 cases of DM occurring after baseline (2,036 white, 749 minority), a total of 524 cases were excluded from the case set using the above criteria, leaving a total of 2,261 (1,651 white, 610 minority).

Control Selection:

A potential control was excluded if they possessed any of the following characteristics:

- Baseline Glucose \geq 126 mg / dl (only available for about 1% of participants)
- Inadequate Baseline Blood and DNA Supply
- Baseline CVD (Defined as having a MI, Angina, Stroke, or CHF)
- Refusal to participate in a genetic study
- Antidiabetics Usage at AV-3
- Baseline or Incident Diabetes

Selection of the remaining controls was done in a time-forward manner, selecting one control for each white case or two controls for a minority case from the risk set at the time of the case's event.

The final control set used for matching consisted of 57,443 whites and 8,160 minorities.

Matching criteria:

Matching is done on age at screening, blood draw time of day, ethnicity, and randomization clinic. Ethnicity and randomization clinic (the categorical variables) were matched exactly, and the continuous matching variables were selected based on a criteria to minimize an overall distance measure (Bergstralh EJ, Kosanke JL. Computerized matching of cases to controls. Technical Report #56, Department of Health Sciences Research, Mayo Clinic, Rochester, MN. April 1995). SAS code is available to implement this matching scheme.

Matching summary:

A total of 2,261 incident cases of DM and 65,603 controls were put into the matching process. 1,646 white cases were successfully matched with controls (5 unmatchable cases). A sample of 664 white cases who were positive for AV-3 Diabetic Medications were initially selected for the study. An additional 436 cases were then selected via simple random sample from the remaining set of matched cases to give a total of 1,100 white case / control pairs. 567 minority cases were successfully matched with two controls each (42 unmatchable cases). The final ethnic distribution of matched cases is as follows:

Ethnicity	Cases	Controls	Total
White	1,100	1,100	2,200
Black	346	692	1,038
Hispanic	134	268	402
Asian	87	174	261

Specific matching summaries are given in the tables below. Each row summarizes the matching performance for a specific variable or overall criteria. For example, for white participants the mean case-control absolute difference in age is 0.02 years (approximately 7 days), with a maximum of three years difference. The mean ages in the white case and control groups are both 64.04. The mean case-control absolute difference in blood draw time (hours since midnight) is 0.10 hours (6 minutes). The 'overall' measurement represents the total of absolute deviations for all matching components. Thus, an overall average weight of 0.11 means that the total difference in age plus the total difference in blood draw time averages to 0.11. The weighting equates a deviation of one year in age to one hour in blood draw time. Ethnicity and Randomization Clinic are matched exactly for all subjects. Tables of white participants (1 control) and minorities (2 controls) were done separately.

Balance on each covariate individually and overall is sufficient.

A. White Cases / Controls

Matching Factor	Sum (weighted) of Absolute Differences	Cases	Controls
	Mean (min, max)	Mean	Mean
Overall	0.11 (0, 3.550)	-	-
Ethnicity	0	-	-
Randomization Clinic	0	-	-
Age (years)	0.02 (0, 3.00)	64.01	64.01
Baseline Blood Draw Time (hours)	0.09 (0, 1.75)	9.84	9.83

B. Minority Cases / Controls

Matching Factor	Sum (weighted) of Absolute Differences	Cases	Controls
	Mean (min, max)	Mean	Mean
Overall	0.67 (0, 4.82)	-	-
Ethnicity	0	-	-
Randomization Clinic	0	-	-
Age (years)	0.28 (0, 3.00)	61.47	61.44
Baseline Blood Draw Time (hours)	0.38 (0, 2.00)	9.95	9.94