

May 14, 2009, updated 6/4/09 , updated 9/7/10

Ancillary Study # 207: Prospective Evaluation of IGF-1, IL-6, and Multiple Myeloma

Case selection:

238 cases of multiple myeloma (ICD-O-3=9732) have been SEER coded in the WHI observational study and clinical trial cohorts as of August 2008. Of these, 197 provisionally meet the eligibility criteria for this study.

Excluded were:

- diagnosis < 3 months after blood draw collection (n=1). *This case shall be included in the DNA phase.*
- cancer history (except non-melanoma skin cancer) at enrollment (n=22),
- cancer (except non-melanoma skin cancer) during follow-up but prior to the myeloma diagnosis (n=12) and
- EDTA sample exhausted and no other sample available (n=6) *These cases shall be included in the DNA phase.*

Other information: 26 cases with insufficient EDTA plasma volume were retained because they either had some EDTA sample available (n=3) or they had serum available (n=23).

All cases were fasting at time of baseline blood draw (≥ 8 hours since last meal).

Control selection:

Women reporting cancer history at baseline were not eligible to be selected as controls. All potential controls have baseline EDTA plasma, were fasting at the baseline blood draw, and have baseline height and weight measurements available. Serum samples were selected for controls matched to cases for whom serum samples will be used. All potential controls have ≥ 4 ug extracted DNA available from a baseline or annual visit blood draw OR a buffycoat from which DNA may be extracted.

Control selection was done in a time forward manner, selecting one control for each case from the risk set at the time of the case's diagnosis. Controls are free of diagnosed cancer (except non-melanoma skin cancer) up to the date of the case diagnosis. The total number of eligible controls was 119879.

The matching algorithm that we use selects the closest match based on a criterion to minimize an overall distance measure. Matching variables can be weighted equally (i.e., all considered equally important) or weighted unequally so that the importance of each matching factor relative to the others is taken into account. Reference: Bergstralh EJ, Kosanke JL. Computerized matching of cases to controls. Technical Report #56, Department of Health Sciences Research, Mayo Clinic, Rochester MN. April 1995.

Final Matching criteria:

Matching was done on

- birth date (\pm two years);
- exact race/ethnicity categorized as White, Black, Hispanic, Other (Asian/American Indian/Other/Unknown)
- CT or OS cohort
- date of blood draw within +/- 4 months
- within same season or within one season difference; season defined as: Fall (1=October, November, December), Winter (2=January, February, March), Spring (3=April, May, June), Summer (4=July, August, September)
- time of day of blood draw within up to 2 two-hour increments
- sample type (EDTA plasma or serum)
- greater weight given to achieving a close match on blood draw date than on birth date, season, or blood draw time.

Matching results/summary for OS cases:

Two controls meeting the matching criteria were matched to each of the 92 OS cases.

Matching summary for 92 case/control sets:

Case/Control #1 Matching Factor	Absolute Difference Mean (min, max)	Cases Mean, or %	Controls (#1) Mean, or %
Birth date (days)	41.5 (0.0, 682.0) ¹	08/1929 (range 03/1916 - 10/1944)	08/1929 (range 02/1916 - 11/1944)
Race/ethnicity	0		
White		77.2%	77.2%
Black		14.1%	14.1%
Hispanic		5.4%	5.4%
Asian/Am Ind/Oth/Unk		3.3%	3.3%
Blood draw date (days)	4.2 (0, 60.0)	08/1996	08/1996
Season			
Fall		16.3%	16.3%
Winter	0.02 (0, 1)	27.2%	26.1%
Spring		29.3%	29.3%
Summer		27.2%	28.3%
Time of day of blood draw (in two hour intervals)			
6-8 am	0.6 (0, 2)	8.7%	6.5%
8-10 am		54.3%	48.9%
10-12 am		33.7%	42.4%
12-2 pm		3.3%	2.2%

Case/Control #2 Matching Factor	Absolute Difference Mean (min, max)	Cases Mean, or %	Controls (#2) Mean, or %
Birth date (days)	57.4 (1.0, 554.0) ²	08/1929 (range 03/1916 - 10/1944)	08/1929 (range 06/1916 - 09/1944)
Race/ethnicity	0		
White		77.2%	77.2%
Black		14.1%	14.1%
Hispanic		5.4%	5.4%
Asian/Am Ind/Oth/Unk		3.3%	3.3%
Blood draw date (days)	5.6 (0, 88.0) ³	08/1996	08/1996
Season			
Fall		16.3%	16.3%
Winter	0.07 (0, 1)	27.2%	25.0%
Spring		29.3%	29.4%
Summer		27.2%	29.3%
Time of day of blood draw (in two hour intervals)			
6-8 am	0.7 (0, 2)	8.7%	6.5%
8-10 am		54.3%	44.6%
10-12 am		33.7%	46.7%
12-2 pm		3.3%	2.2%

¹ Only one case-control pair has birthdates greater than 12 months apart

² Two case-control pairs have birthdates greater than 12 months apart; one of these cases is the same case in footnote 1.

³ One case-control pair has draw dates greater than 2 months apart; same case mentioned in footnote 2 and footnote 1.

Matching results/summary for CT cases:

Two controls meeting the matching criteria were matched to each of the 105 CT cases.
 Matching summary for 105 case/control sets:

Case/Control #1 Matching Factor	Absolute Difference Mean (min, max)	Cases Mean, or %	Controls (#1) Mean, or %
Birth date (days)	34.5 (0, 386.0) ⁴	05/1929 (range 05/1915 - 12/1945)	05/1929 (range 08/1915 - 04/1946)
Race/ethnicity	0	84.8%	84.8%
White		12.4%	12.4%
Black		2.9%	2.9%
Hispanic		0.0%	0.0%
Asian/Am Ind/Oth/Unk			
Blood draw date (days)	3.8 (0, 87.0)	05/1996	05/1996
Season	0.05 (0, 1)	25.7%	24.8%
Fall		24.8%	26.7%
Winter		30.5%	29.5%
Spring		19.0%	19.0%
Summer			
Time of day of blood draw (in two hour intervals)	0.6 (0, 2)	5.7%	3.8%
6-8 am		53.3%	58.1%
8-10 am		38.1%	37.1%
10-12 am		1.9%	1.0%
12-2 pm		1.0%	0.0%
2-4 pm			

Case/Control #2 Matching Factor	Absolute Difference Mean (min, max)	Cases Mean, or %	Controls (#2) Mean, or %
Birth date (days)	45.8 (0, 369.0) ⁵	05/1929 (range 05/1915 - 12/1945)	05/1929 (range 01/1915 - 12/1945)
Race/ethnicity	0	84.8%	84.8%
White		12.4%	12.4%
Black		2.9%	2.9%
Hispanic		0.0%	0.0%
Asian/Am Ind/Oth/Unk			
Blood draw date (days)	5.4 (0, 98.0) ⁶	05/19/1996	05/23/1996
Season	0.02 (0, 1)	25.7%	24.8%
Fall		24.8%	24.8%
Winter		30.5%	31.4%
Spring		19.0%	19.0%
Summer			
Time of day of blood draw (in two hour intervals)	0.5 (0, 2)	5.7%	0.0%
6-8 am		53.3%	62.9%
8-10 am		38.1%	36.2%
10-12 am		1.9%	0.9%
12-2 pm		1.0%	0.0%
2-4 pm			

⁴ One case-control pair has birthdates greater than 12 months apart

⁵ One case-control pair has birthdates greater than 12 months apart; this is the same case in noted in footnote 4.

⁶ One case has a blood draw date that is more than two months different from both her controls. This is the same case-control set with birthdates greater than 12 months apart.