Multiple Primary Melanoma in Association with Other Cancers

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Background

- Multiple primary melanoma (MPM) is associated with familial melanoma.
- The association between MPM and other discordant cancers is not well known.

Aim

- To define the association between MPM and personal history of other cancers.
- To assess the association between MPM and cancer history among first-degree relatives (FDRs).

Method

Study Design: Retrospective case control study

Study Population: Gender-matched patients with MPM (study group) and patients with single primary melanoma (SPM) (control group) at 1:2 ratio from the Melanoma Center of University of Pittsburgh Cancer Institute

Data Collection: Age at diagnosis, gender, melanoma stage, personal history of other cancers, cancer history of FDRs, germline genetic mutation status, prostate cancer screening status.

Statistical Analysis: Univariate logistic regression models were used to determine the association between MPM and personal or family history of other cancers. Multivariable logistic regression models were adopted to assess the above associations after adjusting for age at last physician follow-up, gender, and initial melanoma stage. ORs and 95% confidence intervals (CIs) were reported. All tests were 2-sided. Statistical significance was defined as $p<0.05$. Data were analyzed in R 4.1.0.

Result

Table 1. Comparison of MPM and SPM

Variables	MPM (n=126)	SPM (n=252)	OR	95% CI	p Value
Age, median [IQR], y	47 [34.25, 60.75]	55 [44,75, 65]	0.98	0.97, 0.99	0.002
Male, No (%)	53 (42.1)	114 (45.2)	0.88	0.57, 1.35	0.56
Staging, No (%)					
0 or I	86 (70.5)	115 (45.6)	reference	reference	
II	23 (18.9)	71 (28.2)	0.433	0.25, 0.74	0.003
III	13 (10.7)	55 (21.8)	0.316	0.16, 0.59	0.001
IV	0 (0)	11 (4.4)	-	-	0.98
PH of SCC, No (%)	19 (15.1)	21 (8.3)	1.95	1.001, 3.79	0.047
PH of BCC, No (%)	34 (27)	46 (18.3)	1.66	0.99, 2.74	0.051
PH of sex-unspecific cancers, No (%)	21 (16.7)	42 (16.7)	1.12	0.63, 1.94	0.700
Hematological malignancy	2 (1.6)	7 (2.8)	0.56	0.08, 2.37	0.480
Colorectal	0 (0.0)	7 (2.8)	-	-	0.978
Lung	0 (0.0)	4 (1.6)	-	-	0.983
Renal cell carcinoma	0 (0.0)	2 (0.8)	-	-	0.982
Sarcoma	1 (0.8)	1 (0.4)	2.00	0.08, 51.06	0.62
Melanoma in FDR, No (%)	27 (21.4)	26 (10.3)	2.37	1.31, 4.28	0.004
Other skin cancer in FDR, No (%)	9 (7.1)	23 (9.1)	0.76	0.33, 1.66	0.515
Non-skin cancers in FDR, No (%)[b]	59 (46.8)	120 (47.6)	0.97	0.63, 1.49	0.884
Breast	13 (10.3)	32 (12.7)	0.79	0.39, 1.53	0.501
Prostate	20 (15.9)	15 (6.0)	2.98	1.47, 6.14	0.002
Lung	6 (4.8)	27 (10.7)	0.42	0.15, 0.97	0.060
Colon	12 (9.5)	16 (6.3)	1.55	0.70, 3.38	0.270
Hematological malignancy	10 (7.9)	14 (5.6)	1.46	0.31, 3.35	0.373

Table 2. Comparison of Sex-specific Cancer History Between SPM and MPM

Variables	MPM	SPM	OR	95% CI	p Value
Male	53	114			
Prostate cancer, No (%)	11 (20.7)	10 (8.8%)	2.72	1.07, 7.01	0.034
Prostate cancer screening, No (%)	29 (54.7)	56 (49.1)	1.25	0.65, 2.42	0.50
Female	73	138			
Breast cancer, No (%)	7 (9.6)	8 (5.8)	1.72	0.58, 5.00	0.312
Cervical cancer, No (%)	0 (0.0)	4 (2.9)	-	-	0.98
Ovarian cancer, No (%)	0 (0.0)	1 (0.7)	-	-	0.99
Uterine cancer, No (%)	0 (0.0)	1 (0.7)	-	-	0.99

Result

Table 3. Multivariable Analysis Between SPM and MPM

MPM Yes/no	OR	95% CI	p Value
PH of SCC	2.18	1.08, 4.39	0.028
PH of prostate in males	2.85	1.095, 7.537	0.032
Melanoma in FDR	2.37	1.31, 4.29	0.004
Prostate Cancer in FDR	3.26	1.59, 6.83	0.001

Conclusions

- Patients with MPM have higher prevalence of prostate cancer in both univariable analysis and multivariable analysis
- Patients with MPM and SPM have otherwise similar personal and family cancer spectrum

Strengths and Limitations

- Strengths: thorough data collection, the availability of prostate cancer screening status
- Limitations: retrospective design, single center data origin, limited data from FDRs and possible recall bias

Acknowledgement

- This study was approved by the Institutional Review Boards (IRB) of University of Pittsburgh.

Abbreviations

- MPM: multiple primary melanoma; SPM: single primary melanoma; PH: personal history; IQR, interquartile ranges; SCC, squamous cell carcinoma; BCC: basal cell carcinoma; FDR: first-degree relative; OR, odds ratio; 95%CI, 95% confidence intervals.

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