Does *in situ* melanoma really come before invasive melanoma? Descriptive epidemiology questions this relationship

Emanuele Crocetti[1], Adele Caldarella[1], Alessandra Chiarugi[2], Paolo Nardini[2], and Marco Zappa[1]

[1]UO Epidemiologia Clinica e Descrittiva, ISPO, Florence; [2]Melanoma Early Diagnosis Service, ISPO, Florence, Italy

While the incidence rates for skin melanoma have increased worldwide in the last decades, Breslow tumor thickness has decreased[1]. The incidence of *in situ* melanoma has also increased, and it doubled in the USA between 1988 and 2006[2]. These recent trends are in part due to the diffusion of early diagnosis[1,2], which is based on the assumption that the detection of less invasive lesions (i.e., those susceptible to more effective treatment) will prevent the occurrence of the more invasive and deadly ones. If the pattern for melanoma indicated a worsening progression from *in situ* to invasive lesions-thin, first, then thick-the mean age at diagnosis for such lesions should increase accordingly.

We retrieved melanoma cases incident between 2000 and 2005 from the Tuscany Cancer Registry archive. This is a population-based cancer registry active in central Italy since 1985 on a population of about 1.2 million inhabitants. Between 2000 and 2005, 1513 skin melanomas were newly diagnosed, 318 (21.0%) *in situ* and 1195 (79.0%) invasive. Among the latter, 607 (50.8%) were ≤1 mm, 410 (34.3%) >1 mm, while the Breslow thickness of 178 lesions (14.9%) could not be assessed. The mean ages of patients at diagnosis of melanomas *in situ* (57.69 years) and invasive melanomas (57.52) were similar (Student's *t*-test, $P = 0.87$). However, among invasive melanomas, thin lesions (≤1 mm) were diagnosed at a younger age (54.03 years) than among *in situ* melanomas ($P = 0.0014$). By contrast, patients with >1 mm thick melanomas were older at the time of diagnosis (61.95 years) than patients with *in situ* melanomas (Table 1). These results are mainly due to lentigo maligna melanomas, which occur at a rather old age (mean age at diagnosis 71.3 years) and are more frequent among *in situ* (69/318, 21.6%) than among invasive melanomas (36/1195; 3.0%).

Table 1 - Tuscany Cancer Registry, skin melanoma 2000-2005

	Number	Mean age	SE	P
Behavior				
in situ	318	57.69	0.92	
Invasive	1195	57.52	0.50	0.87
Thickness				
0.01 to ≤1 mm	607	54.03	0.67	0.0014
>1 mm	410	61.95	0.87	0.0009
Missing	178	59.22	1.31	0.33

The *P* value indicates the probability that the mean age at diagnosis of patients with *in situ* melanoma is equal to that of other groups of patients according to Student's *t*-test.

According to the present data, *in situ* melanoma does not seem an obligate precursor of thin invasive melanoma, as it is diagnosed at an older age than invasive melanoma ≤1 mm. Although most of the results are driven by lentigo maligna melanomas, descriptive epidemiology suggests different pathways for *in situ* and invasive melanomas, at least for thin ones. There may be 2 different *in situ* melanomas, some with an indolent behavior and others which are more aggressive; micromelanomas invasive at diagnosis[3] may belong to the latter group.

References

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Correspondence to: Emanuele Crocetti, UO Epidemiologia Clinica e Descrittiva, ISPO, Via di San Salvi 12, 50135 Florence, Italy.
Tel +39-055-6268320;
fax +39-055-679954;
e-mail e.crocetti@ispo.toscana.it

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