

Melanoma and PET-CT: The First Systematic Review and Meta-Analysis of False Positive Findings in PET-CT for Cutaneous Malignant Melanoma

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Background: Cutaneous malignant melanoma (CMM) is increasing in prevalence and possesses the highest mortality rate of any skin cancer. Positron Emission Tomography and Computed Tomography (PET-CT) may be utilised in either radiological staging or surveillance of CMM, primarily in stage III-IV disease but can be limited by false positive (FP) results; leading to patient distress, increased costs, and unnecessary follow-up. The FP rate in CMM literature varies widely, altering calculations of positive predictive value (PPV) and has not undergone pooled meta-analytic.

Methods: A systematic review and meta-analysis of FP results in prospective studies of PET- CT in CMM was performed.

Results: The systematic review produced 14 trials for inclusion. Patient-based reporting had the lowest pooled proportion of FP results with 5.8% (95% CI = 3.5% to 8.6%), lesion-based was highest with 9.6% (95% CI = 3.1% to 19.1%) and combined was 7.0% (95% CI = 4.4% to 10.2%) Bias was low to unclear other than for FP reporting and heterogeneity (I²) was considerable for all analyses. FP findings were mainly lymphatic, dermatological, respiratory, or skeletal in nature but diagnostic information was not provided.

Conclusions: This study was the first attempt to quantify the pooled proportion of FP results from PET-CT in CMM. A small number of studies (n=14) were available due to the predominance of retrospective methodology in this field. It is unclear whether this represents the true proportion of FP results due to inconsistent reporting. Systemic distribution was expected but limited diagnostic information was provided. Repeat meta-analysis using retrospective work should be carried out and future work should be prospective with clearly documented FP proportion, distribution, diagnosis and need for follow-up.

