18F-FDG-PET and PET/CT as a diagnostic method for Ewing sarcoma: a systematic review and meta-analysis.

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August 7, 2021

Abstract

Purpose: The aim of this study was to evaluate the diagnostic accuracy of 18-fluorodeoxyglucose-positron emission tomography (18F-FDG-PET) and positron emission tomography/computed tomography (PET/CT) in imaging primary and metastatic lesions in Ewing sarcoma (ES). Methods: PubMed, Cochrane, Scopus, and Web of Science were searched for relevant studies. Data concerning 18F-FDG-PET/CT diagnostic accuracy were extracted and then analysed using Open Meta-analyst software. Reported diagnostic accuracy outcomes included sensitivity, specificity, negative likelihood ratio (NLR), positive likelihood ratio (PLR), and diagnostic odds ratio. Results: 31 studies with a total of 735 patients were included in this meta-analysis. The sensitivity and specificity of 18F-FDG PET/CT were: 92.6% and 74.1% for total ES lesions, 96.7% and 68.3% for ES primary lesions, 76.1% and 92.4% for lung metastasis, 83.9% and 93.2% for bone metastasis and 89.9% and 92.6% for ES recurrence respectively. Conclusion: 18F-FDG PET/CT is sensitive and accurate in diagnosing, staging, and detecting the recurrence of ES compared to non-PET imaging. It has high specificity for diagnosing recurrence of ES as well as lung and bone metastases.

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Main text word count : 3764 words

Abstract word count : 215 words

Brief running title: Accuracy of FDG PET/CT in Ewing Sarcoma

Keywords: 18 F-FDG PET; PET/CT; diagnostic accuracy, Ewing sarcoma; meta-analysis; metastasis; recurrence.

Tables : 2

Figures : 6

Supplementary file : 1

Abbreviations Table

Abbreviation	Definition
^{18}F	18 Fluorine
$^{18}\text{F-FDG}$	18 fluorine-fluorodeoxyglucose
BMB	bone marrow biopsy
CI	confidence interval
CT	computed tomography
DOR	diagnostic odds ratio
ES	Ewing Sarcoma
FDG	fluorodeoxyglucose
FP	false positive
HL	Hodgkin Lymphoma
I^2	I square
IV	intravenous
MBq	mega Bequerel
mCi	milli Curie
MRI	magnetic resonance imaging
NHL	Non-Hodgkin Lymphoma
NLR	negative likelihood ratio
NPV	negative predictive value
PET	positron emission tomography
PLR	positive likelihood ratio
PPV	positive predictive value
PRISMA	Preferred Reporting Items for Systematic Reviews and Meta-Analyses
QUADAS	quality assessment of diagnostic accuracy studies
ROC	receiver operating characteristic
SEMI	semiquantitative
SPECT	single-photon emission computed tomography
SROC	summary receiver operating characteristic
TN	true negative
TP	true positive
¹⁸ F-FDG PET	18 fluorine-fluorodeoxyglucose positron emission tomography
18 F-FDG PET/CT	18 fluorine-fluorodeoxyglucose positron emission tomography $/$ computed tomography
99mTc-MDP	Technetium 99m-methyl diphosphonate
PET/CT	positron emission tomography/ computed tomography
PRISMA-DTA	Preferred Reporting Items for Systematic Reviews and Meta-Analyses of Diagnostic Test Accuracy St

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