

Selected Summary

The diagnostic value of FDG PET/CT for primary ovarian cancer-A prospective study
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This study evaluates the diagnostic value of combined Positron emission tomography and computerized tomography (PET/CT) using Flourine-18 fluoro-2-deoxy-D-glucose (F-18 FDG) in detecting a malignant tumour in patients presenting with a pelvic mass with no previous cancer history. PET/CT was performed in 101 consecutive patients (mean=60 years, range=24-85 years) with suspected pelvic tumour. Risk Malignancy Index (RMI) was calculated as an index of ultrasound, CA-125 and menopausal state. Patients with RMI>150 were included for this study. A RMI cut-off level of 150 was chosen to ensure inclusion of a sufficient number of patients with benign tumours. PET/CT was performed with in 2 weeks prior to standard staging/debulking surgery.

Out of 101 patients, four patients with benign PET/CT results chose not to go through the operation (or biopsy). In the remaining 97

patients median serum CA-125 level was 784 u/ml (range=22-9665 u/ml). Ninety-one patients (94%) had RMI>200. In 36 of these 91 patients (40%) with RMI>200 the tumour was benign. Using a cut-off level of 200 the sensitivity of RMI in recognizing a malignant tumour was 96.5% (55 of 57) and the specificity was 10% (4 of 40) (p=0.4). Ninety-one patients had an exploratory laparotomy and 2 patients had an exploratory laparoscopy with subsequent histopathological examination of the tumour. The remaining four patients were pathologically diagnosed by biopsy.

PET/CT demonstrated areas of abnormally increased metabolic activity considered highly suspicious for malignant tumour in 60 patients (62%). In 37 patients (38%) the tumours were considered benign on PET/CT. Histopathology showed benign tumours in 40 patients, malignant tumours in 57 patients and seven patients were diagnosed with borderline tumours which were interpreted as benign. PET/CT imaging was true positive in all 57 patients with malignant tumours. In 37 of 40 patients with benign tumours, PET/CT results were true negative. PET/CT was false positive in 3 patients with benign histology. PET/CT demonstrated normal metabolic activity in 7 patients diagnosed with borderline tumours, which were interpreted as benign tumours. The sensitivity and specificity of PET/CT in detecting a malignant pelvic tumour was 100% (57/57) and 92.5% (37/40), respectively (p<0.00005). Sixteen of the 27 patients (59%) with surgical stage IIIc ovarian cancer showed areas of abnormally increased metabolic activity on PET/CT that indicated metastatic disease.

They concluded that combined PET/CT demonstrates high diagnostic value in identifying primary ovarian cancer in patients with a pelvic mass of unknown origin and RMI

>150. The authors suggested PET/CT as the imaging modality of choice when ultrasound shows a pelvic tumour and additional information prior to surgery is needed.

COMMENTS:

Imaging plays an important role in the management of ovarian cancer. It is important for detection and characterization of ovarian lesions, preoperative staging, monitoring treatment response and follow-up. Most commonly used imaging modalities in ovarian carcinoma include Ultrasonography, CT and MRI. F-18 FDG PET-CT is now a standard imaging modality in various cancers like lymphoma, lung carcinoma, melanoma, head & neck tumours, breast cancer and gastrointestinal malignancies. In gynecological malignancies the role of PET-CT is widely investigated in the cervical cancer but its role in the management of uterine and ovarian carcinoma is still to be determined. There is enough evidence in the literature to suggest the role of PET and PET-CT in detection of recurrence of ovarian cancer.^{1, 2, 3}

Several authors have evaluated the role of FDG-PET in the diagnosis of primary ovarian cancer. However the results have not been favorable or have revealed that PET can be of value only if used as a complementary imaging with other conventional imaging modalities like ultrasonography, CT and MRI.^{4,5} PET alone has low specificity for diagnosis of primary ovarian cancer. The limitation of FDG-PET and its low specificity can be attributed to normal physiological distribution of FDG in the pelvis and its concentration in inflammatory and benign conditions.⁶ PET alone is limited in its ability to provide information on the exact localization of lesions because of the absence of precise anatomic landmarks. Therefore the advent of fused PET/CT, combining the

morphological and functional data can help in improving the accuracy.

This study highlights the advantages of combining the morphological and functional imaging using PET/CT. This is the first study demonstrating the utility of PET/CT in diagnosis of primary ovarian cancer in patients with pelvic masses of unknown origin. This is otherwise not considered a routine indication for PET imaging in management of ovarian cancer. The authors showed higher sensitivity and specificity for primary ovarian cancer than has been reported for ultrasonography, CT, MRI and PET alone. Moreover as PET/CT is performed as a whole body imaging, occult distant metastases can also be detected which may be missed on conventional imaging. PET/CT can upstage the disease and therefore change the management in these patients.

However, the authors have limited the interpretation of FDG avid lesions to qualitative assessment. They have not used semi-quantitative parameters like standardized uptake value (SUV) in interpretation of the lesions and also not investigated the inter-observer variability in analyzing the results. Still this study has shown the possibility of using PET/CT in this group of patients. More studies with favorable results confirming the role of PET/CT in the diagnosis of primary ovarian cancer are needed. Then, PET/CT can help avoid unnecessary surgeries in asymptomatic patients with a pelvic tumour. Also, in patients undergoing surgery, PET/CT can help find the sites where the tumour has to be removed during the surgery to perform optimal primary cytoreductive surgery. As PET/CT imaging becomes more accessible it is likely to play more an important role in clinical indications where PET alone had limitation and can widen the spectrum of PET/CT use in the management of gynecological cancers.

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