Clinical Effectiveness of PET/CT, PET, CT and MRI for Breast, Cervical, Head and Neck, Gastric and Lung Cancer-A Systematic Review and Meta-analysis

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Abstract **- Background: We performed a systematic review and meta-analysis to assess the accuracy of PET/CT, PET, CT and MRI for the detection of Breast cancer, Cervical cancer, Head and Neck cancer, Gastric cancer and Lung Cancer.**

Methods: Electronic databases were searched for studies assessing the sensitivity and specificity of PET/CT, PET, CT and MRI. A total of 345 articles from 61 meta-analysis and 3 HTA's were included in this review. Revman software was used to assess the sensitivity, specificity. The Quality Assessment of Diagnostic Accuracy Studies 2 (QUADAS-2).

Results: Total number of studies included in this systematic review and meta-analysis are 345 studies comprising of patients with Cervical cancer, Breast cancer, Head and Neck cancer, Gastric cancer and Lung cancer. The pooled sensitivity and specificity estimate of PET/CT, PET, CT and MRI for detecting above mentioned five cancers. After pooling all studies of CT, MRI, PET and PET/CT for cervical cancer the Forest plot of sensitivity and specificity of CT 0.62 (0.57, 0.67), 0.92 (0.57, 0.67), MRI 0.52 (0.49,0.55), 0.96 (0.95, 0.96) PET 0.90 (0.86,0.93) 0.93(0.91, 0.94) and PET/CT 0.65(0.62, 0.68) 0.97(0.97,0.98) in detecting LN metastases cervical cancer Tumors staging like IA, IB II A, II B, IIIA and IVA in cervical cancer with 95% CI. After pooling all studies, of CT, MRI, PET and PET/CT for Breast cancer the Forest plot of sensitivity and specificity of CT 0.87 (0.85, 0.89), 0.35 (0.33,0.38) MRI 0.97 (0.94, 0.98), 0.88(0.84, 0.91) PET 0.89 (0.86,0.90) 0.91(0.89, 0.93) and PET/CT 0.86(0.83, 0.88) 0.91(0.89, 0.93) in detecting local recurrences, lesion basis, distant metastases, and breast lesions in Breast cancer with 95 % CI After pooling all studies, of CT, MRI, PET and PET/CT for Head and Neck cancer the Forest plot of sensitivity and specificity of CT 0.81(0.77,0.85), 0.72(0.70, 0.74) MRI 0.77(0.74,0.79), 0.78(0.77,0.79) PET 0.20 (0.16, 0.25) 0.94(0.92, 0.96) and PET/CT 0.84(0.82,0.86) 0.88(0.86,0.89) in detecting Lymph node metastasis, detection of recurrence in patients and detecting neck levels I, II, and III with head and neck cancer Head and neck cancer with 95 % CI. After pooling all studies of CT, MRI, PET and PET/CT for Gastric cancer the Forest plot of sensitivity and specificity of CT 0.77(0.71,0.82), 0.95 (0.93,0.97) MRI 0.84 (0.73, 0.93), 0.85 (0.78,0.91), PET 0.41(0.25,0.58) 0.96 (0.92,0.99) and PET/CT 0.85 (0.77,0.91) 0.95 (0.90, 0.98) in detecting recurrent gastric cancer and Peritoneal metastases in Gastric cancer with 95 % CI. After pooling all studies, of CT, MRI, PET and PET/CT for Lung cancer the Forest plot of sensitivity and specificity of CT 0.71 (0.66, 0.75), 0.82 (0.80,0.85) MRI 0.65(0.59,0.71), 0.91(0.89,0.94) PET 0.83 (0.79, 0.86) 0.93 (0.91 0.95) and PET/CT 0.78(0.77, 0.80) 0.90 (0.89, 0.90) in detecting mediastinal lymph node metastases, detecting stage IIIb, local T and N stage, M-stage lung cancer, solitary pulmonary nodule in lung cancer with 95 % CI.

Conclusion: Overall, PET/CT has a better clinical diagnostic accuracy in detecting stages in of different of cancers.

Index Terms **- Positron emission tomography with computer tomography (PET/CT), pelvic node, meta-analysis, Diagnostic test accuracy, sensitivity, and specificity.**

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I.INTRODUCTION

Cancer is the leading cause of death in economically developed countries and the second leading cause of death in developing countries [1]. PET/CT is widely used in assessing the extent of disease as part of management for a number of malignancies. PET, now used in conjunction with computed tomography (CT) in PET/CT devices, has had its greatest impact on cancer [2]. PET/CT is used in the early stage,

estimation of the therapeutic response, revelation of recurrent disease, and distal metastasis [3]. In India five most leading cancers like Cervical cancer, Breast cancer, Head and Neck cancer, Gastric cancer and Lung cancer were included in this review. Prevalence for Indian women ages 15 to 49 was only 29.8% in India. Lifetime cervical cancer screening prevalence was low (29.8%) and varied by geographic region, ranging from 10.0% in the Northeast Region to 45.2% in the Western Region. Prevalence of screening was higher among women with higher levels of education and household wealth, those who had ever been married, and urban residents. Prevalence of breast cancer is associated with factors like age 20-60, time trends and other risk factors to understand disease burden and pattern in India. About 54% of women with breast cancer in Thiruvananthapuram, which lies in the southernmost part of India. The prevalence of Head and neck cancer is more due to excessive consumption of alcohol, tobacco chewing, smoking. Men face twice the risk of developing head and neck cancer when compared to women. India has a high prevalence of H. pylori infection will have less chances of gastric cancer rates. The prevalence was found to be much higher in the north eastern region of India. Currently, the north eastern state of Mizoram occupies the first position among Indian states and fifth position globally with Age adjusted rate (AAR) of 46.3 to 70.2. The prevalence of gastric cancer is also high in the state of Manipur. Prevalence of lung cancer in different geographical areas nearly, 70% of all the new cases of lung cancer in the world occur in the developed countries. The systematic review and meta-analysis on Diagnostic test accuracy were conducted for the patients with 18-65 years of both male and females was considered in this review. PET/CT was taken as intervention which was compared with PET, CT and MRI with the outcomes of accuracy which was measured in Sensitivity and specificity of PET/CT, PET, CT and MRI for five different cancers. Patients suffering with cancer has some comorbidities like Hypertension, hyperlipidemia, osteoarthritis, hypothyroidism, diabetes mellitus and coronary artery disease. Many observational studies, prospective, retrospective, and Randomized control trails were included in the review along with these studies three Health technology Assessment were also included. The Search was conducted through electronic database like PubMed, Google scholar and Cochrane data bases. The importance of the review is to show how PET/CT, PET, CT, and MRI are clinical effective in treating different types of cancers.

II. METHODS

A. Literature Search

The systematic review was conducted by primary electronic database search. Searches were conducted in PubMed, Google scholar and Cochrane data bases. The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement was developed for this review. The first stage of the data extraction is calculation of sensitivity and specificity for each study, which is conducted as per the standard 2×2 table.

B. Inclusion criteria

Cancer patients, patients presenting with cervical cancer, breast cancer, Head and neck cancer, gastric cancer, and Lung cancer with the age of 18-65 years in both male and female.

C. Exclusion Criteria

Excluded studies from the data were pancreas, bladder, or ureter cancer, colon cancer, ovarian cancer, and thyroid cancer because their outcome evaluation methods were different, Loss of quantitative data, Being not relevant to the main subject, Mismatching interventions and outcomes and incorrect population.

D. Screening Process

All articles identified by the search were initially screened for eligibility on title and abstracts. The search results were exported to the reference management software EndNote X7. Duplicate articles were removed, and the remaining titles and abstracts were screened. Full-text articles were retrieved and assessed for eligibility using predefined criteria, for inclusion in the review. The target population was patients suffering with Cervical cancer, Breast cancer, Head and neck cancer, Gastric cancer, and Lung cancer.

E. Quality Evaluation

Risk of bias in the included studies refers to the addressing of specific aspects that may have introduced systematic errors (i.e., bias) into a study. The most widely accepted tool for methodological

appraisal of the studies included in the review is the Quality Assessment of Diagnostic Accuracy Studies-2 (QUADAS-2) tool, which assesses the quality of the included studies in terms of biases affecting their applicability in four domains: patient selection, index test, reference standard and flow and timing was performed using Review manager software version 5.3. was performed to evaluate the diagnostic accuracy qualities of the 345 eligible articles. A summary estimate of data combined in meta-analysis is considered to be the highest level of evidence.

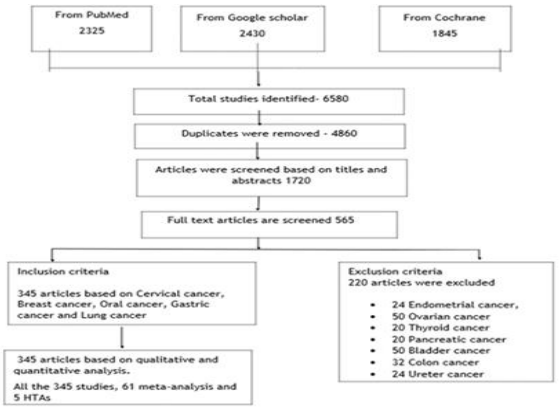
F. Statistical Analysis

The data from the 345 selected studies was extracted and assembled into a 2×2 table, which consisted of true positive (TP), false-negative (FN), false-positive (FP) and true-negative (TN) values. Forest plots of sensitivity and specificity were generated using Revman.

III. RESULTS

A total of 6580 articles were identified by the search strategy of different databases like PubMed, Google scholar and Cochrane of which 4860 were removed based on duplicates, 1720 articles were removed based on title and abstract. The full texts of 565 articles were screened, of which 345 articles met the inclusion criteria and were included in this review and 345 articles were taken into consideration based on the qualitative and quantitative analysis.

A. Prisma



B. Study characteristics of included Studies

The study characteristics patients suffering with Cervical, Breast, Head and Neck, Gastric Cancer and Lung cancer for PET/CT, PET, MRI, and CT are included in the study. Total number of studies included in this systematic review and meta-analysis all together are 345 studies. All the included studies are Randomized control trail retrospective and prospective study design, respectively. All the studies are clinically, methodologically, and statistically similar in their characteristics with same outcomes. The accuracy of PET/CT, PET, MRI, and CT were performed by meta-analysis through sensitivity and specificity which is a dichotomous data of 2x2 table which shows the true positive, true negative, false positive and false negative values of overall accuracy of the device performance was given in the percentage for all five cancers such as Cervical, Breast, Head and Neck, Gastric and Lung Cancer. The results of each individual study are presented. Meta-analysis was performed, the primary measures are pooled sensitivity and specificity of diagnostic measures.

C. Critical Appraisal: Study quality and study design

This summarizes the methodological quality of all included studies after assessment by the QUADAS-2 tool [4]. If the answers to all of the questions about a domain were judged as 'yes', indicating a low risk of bias, then this domain was judged to be at low risk of bias. In contrast, if one was judged as 'no', then that would indicate 'high risk', and a potential bias might exist. 'Unclear' indicated insufficient information to determine whether partial verification was present. A summary graphic may be helpful to convey the methodological quality of each study. Risk of bias graph and summary shows how published DTA systematic reviews have graphically summarized the methodology quality of the included studies according to responses to the QUADAS checklist criteria.

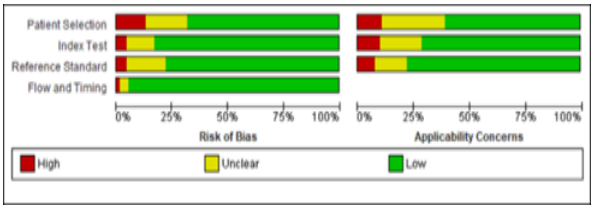


Fig. 1. Risk of bias Graph for Cervical cancer

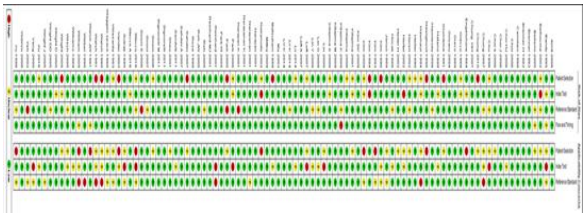


Fig. 2. Risk of Summary Cervical cancer

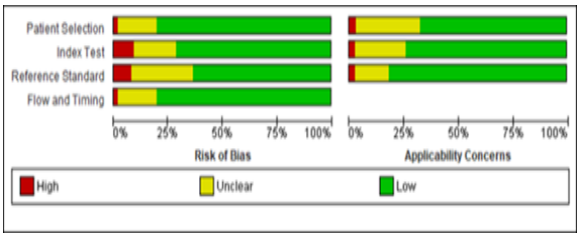


Fig. 3. Risk of bias Graph for Breast cancer

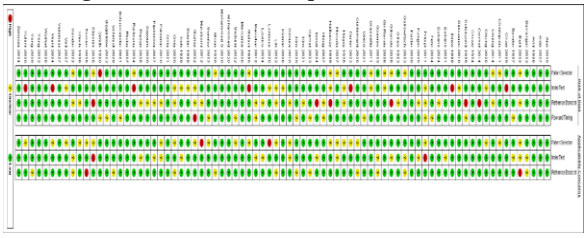


Fig. 4. Risk of bias Summary Breast cancer

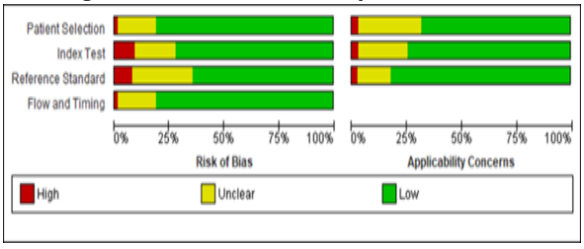


Fig. 5. Risk of bias Graph for Head and Neck cancer

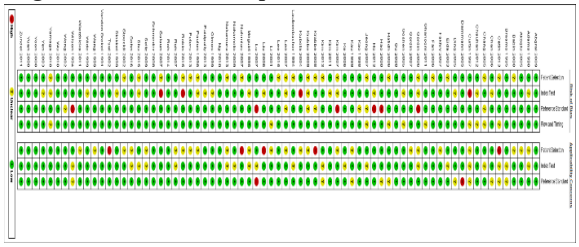


Fig. 6. Risk of bias Summary for Head and Neck cancer

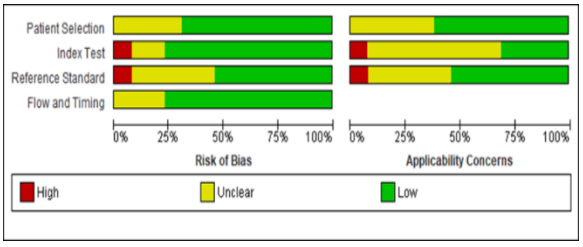


Fig. 7. Risk of bias Graph for Gastric cancer

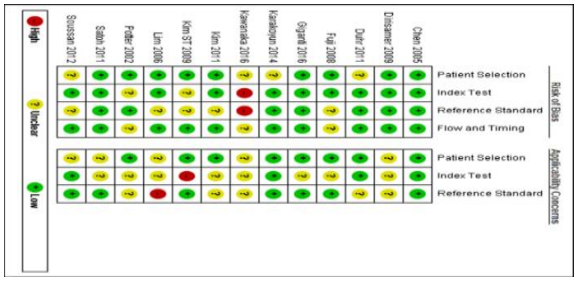


Fig. 8. Risk of bias Summary for Gastric cancer

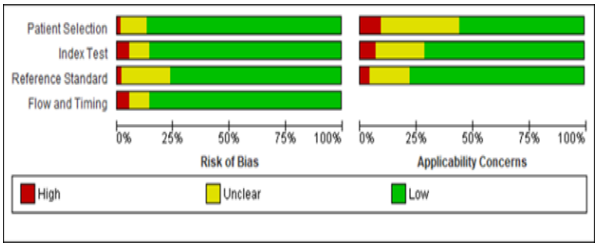


Fig. 9. Risk of bias Graph for Lung cancer

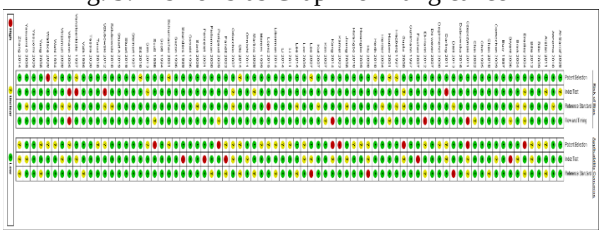


Fig. 10. Risk of bias Summary for Lung cancer

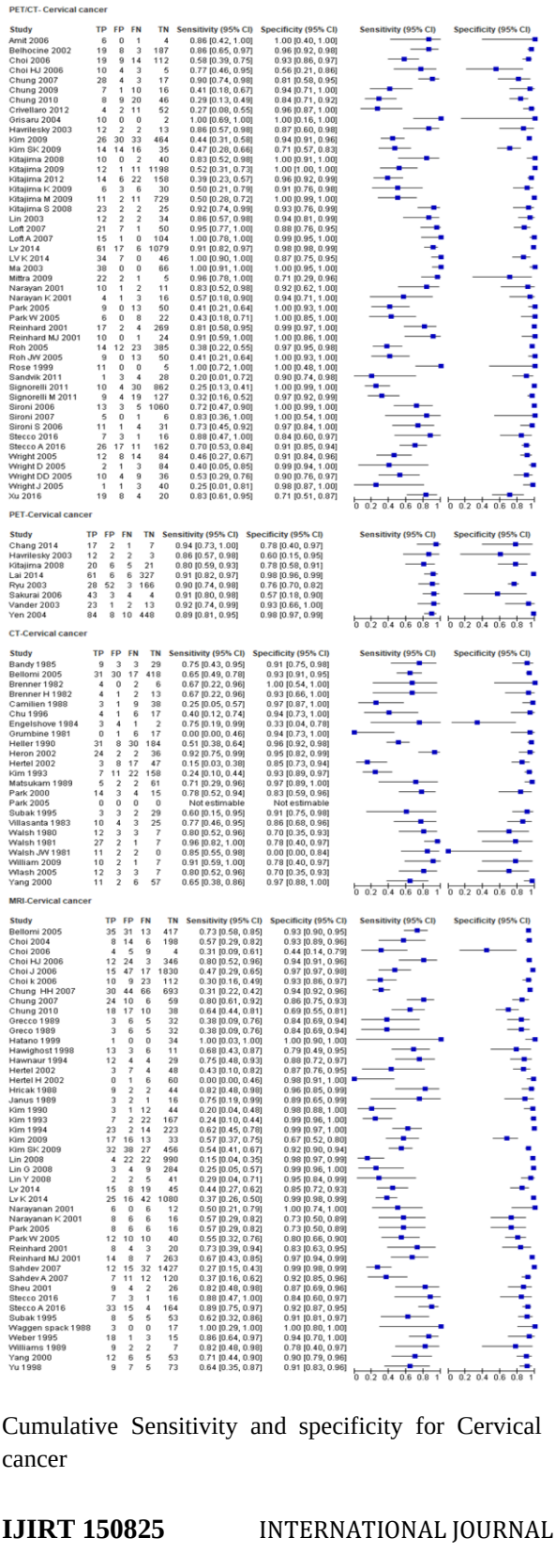
V. SENSITIVITY ANALYSIS

Diagnostic test results are often defined on a dichotomous scale. Where the test result could be negative or above which it could be positive. With such a cutoff, results of a diagnostic test could be placed in a 2×2 table with the test result, which are used to synthesize diagnostic test accuracy studies. The relationship between the sensitivity-specificity pair will define the appropriate approach to synthesizing outcomes. Meta-analysis could be used to assess DTAs of the same condition, in which case the performance between tests should be described together with each test's individual performance.

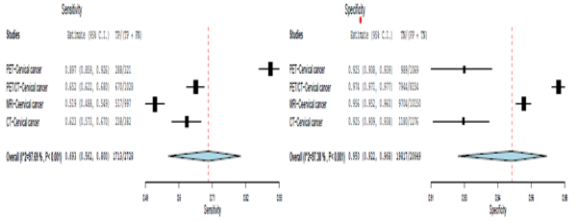
A. Forest plot for Cervical cancer

The Diagnostic test accuracy is represented by the summary statistics and summary line from four sets of basic data, namely true positive (TP), false positive (FP), false negative (FN), and true negative (TN). Representative summary statistics are the sensitivity, specificity. Forest plot of sensitivity and specificity of detecting cervical cancer with PET with the 95 % CI for each population of the included studies. A total of 124 studies were included in this meta-analysis. Among them, 8 studies had reported the performance of PET, 49 studies had reported the performance of PET/CT, 45 studies had reported the performance of MRI and 22 studies had reported the performance of CT, respectively. After pooling all studies, of CT, MRI, PET and PET/CT Forest plot of sensitivity and specificity of CT 0.62 (0.57, 0.67), 0.92 (0.57, 0.67), MRI 0.52 (0.49,0.55), 0.96 (0.95, 0.96) PET 0.90 (0.86, 0.93) 0.93(0.91, 0.94) and PET/CT 0.65 (0.62,

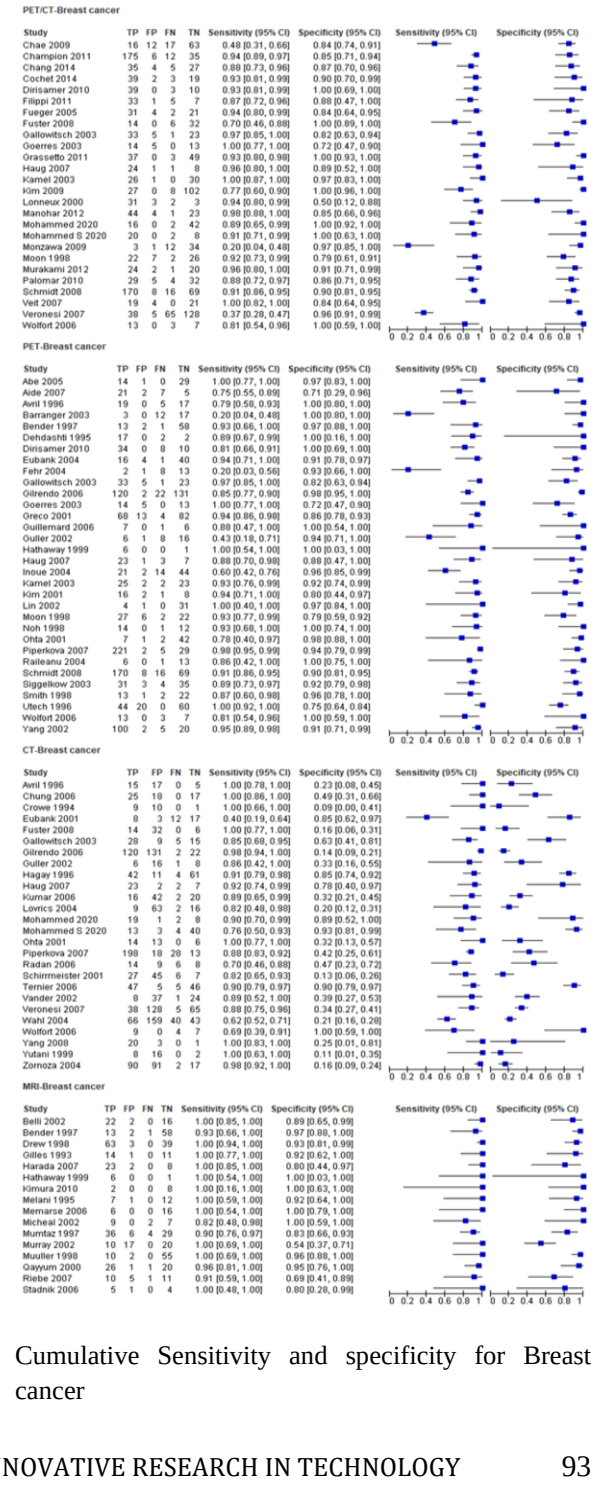
0.68) 0.97(0.97,0.98) in detecting LN metastases cervical cancer Tumors staging like IA, IB IIA, IIB, IIIA and IVA in cervical cancer with 95 % CI for each population of the included studies.



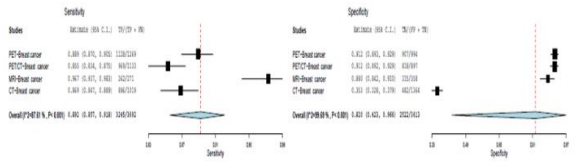
Cumulative Sensitivity and specificity for Cervical cancer



B. Forest plot for Breast cancer



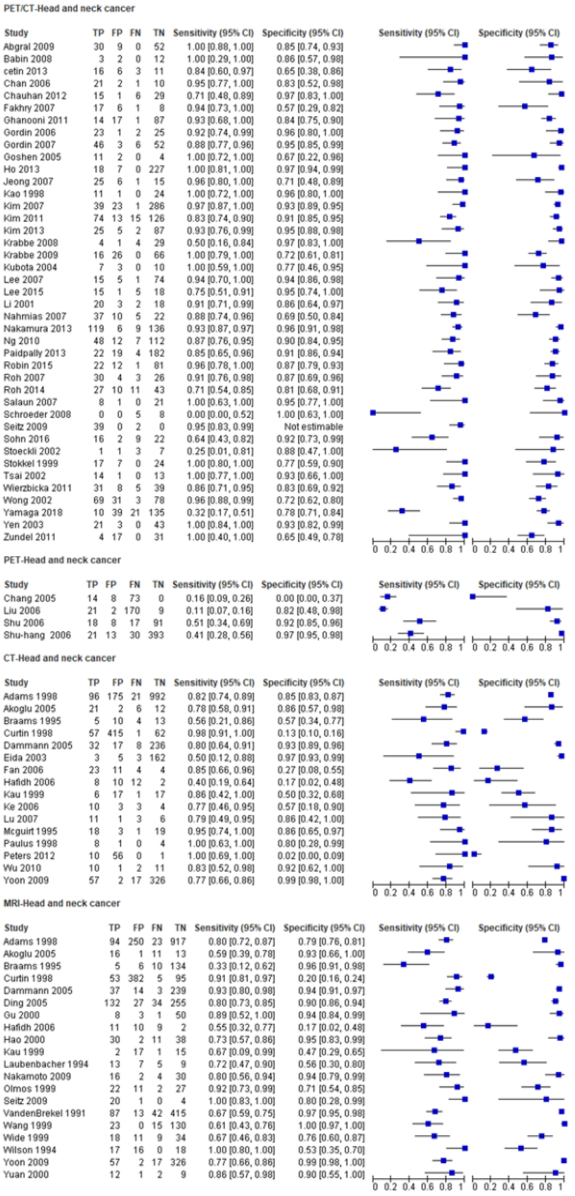
Cumulative Sensitivity and specificity for Breast cancer



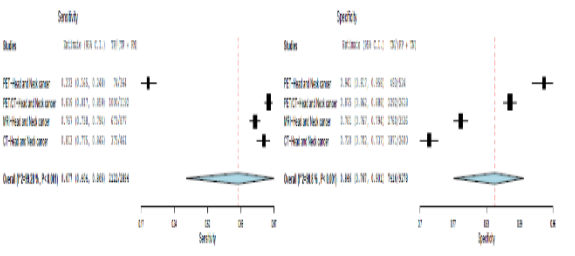
The Diagnostic test accuracy is represented by the summary statistics and summary line from four sets of basic data, namely true positive (TP), false positive (FP), false negative (FN), and true negative (TN). Representative summary statistics are the sensitivity, specificity. Forest plot of sensitivity and specificity of detecting cervical cancer with PET with the 95 % CI for each population of the included studies. A total of 99 studies were included in this meta-analysis. Among them, 32 studies had reported the performance of PET, 25 studies had reported the performance of PET/CT, 16 studies had reported the performance of MRI and 26 studies had reported the performance of CT, respectively. After pooling all studies, of CT, MRI, PET and PET/CT Forest plot of sensitivity and specificity of CT 0.87 (0.85, 0.89), 0.35 (0.33,0.38) MRI 0.97 (0.94, 0.98), 0.88(0.84, 0.91) PET 0.89 (0.86,0.90) 0.91(0.89, 0.93) and PET/CT 0.86(0.83, 0.88) 0.91 (0.89, 0.93) in detecting local recurrences, lesion basis, distant metastases, and breast lesions in Breast cancer with 95 % CI for each population of the included studies.

Forest plot for Head and Neck cancer

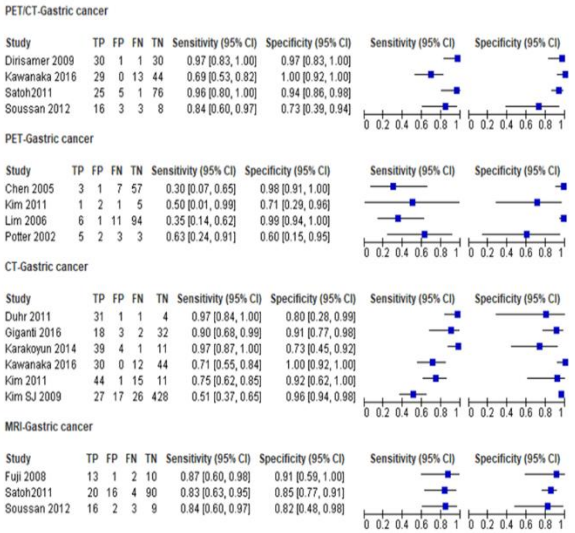
The Diagnostic test accuracy is represented by the summary statistics and summary line from four sets of basic data, namely true positive (TP), false positive (FP), false negative (FN), and true negative (TN). Representative summary statistics are the sensitivity, specificity. Forest plot of sensitivity and specificity of detecting cervical cancer with PET with the 95% CI for each population of the included studies. A total of 81 studies were included in this meta-analysis. Among them 4 studies had reported the performance of PET, 41 studies had reported the performance of PET/CT, 20 studies had reported the performance of MRI and 16 studies had reported the performance of CT respectively. After pooling all studies, of CT, MRI, PET and PET/CT Forest plot of sensitivity and specificity of CT 0.81 (0.77,0.85), 0.72 (0.70, 0.74) MRI 0.77 (0.74,0.79), 0.78 (0.77,0.79) PET 0.20 (0.16, 0.25) 0.94 (0.92, 0.96) and PET/CT 0.84 (0.82,0.86) 0.88 (0.86,0.89) in detecting Lymph node metastasis, detection of recurrence in patients and detecting neck levels I.



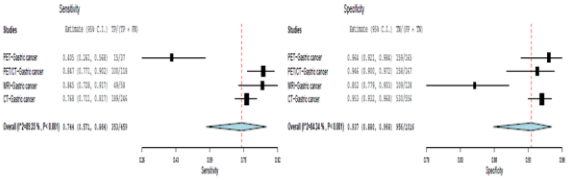
Cumulative Sensitivity and specificity for Head and Neck cancer



Forest plot for Gastric cancer

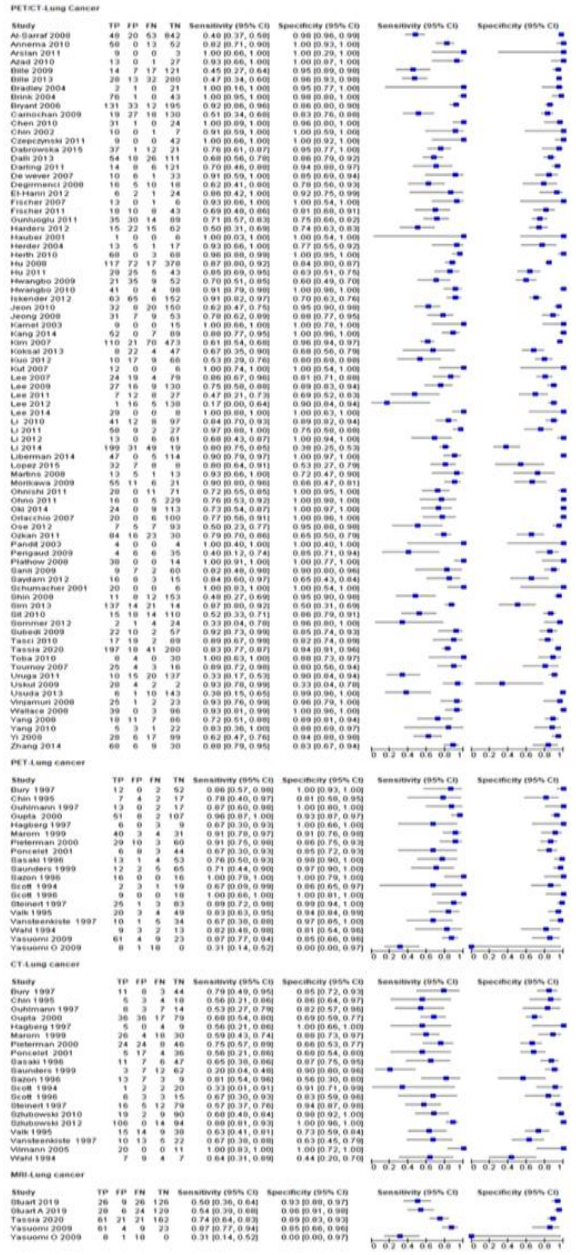


Cumulative Sensitivity and specificity for Gastric cancer

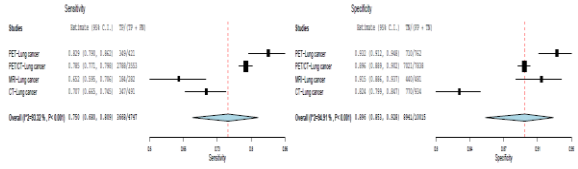


The Diagnostic test accuracy is represented by the summary statistics and summary line from four sets of basic data, namely true positive (TP), false positive (FP), false negative (FN), and true negative (TN). Representative summary statistics are the sensitivity, specificity. Forest plot of sensitivity and specificity of detecting cervical cancer with PET with the 95 % CI for each population of the included studies. A total of 17 studies were included in this meta-analysis. Among them 4 studies had reported the performance of PET, 4 studies had reported the performance of PET/CT, 3 studies had reported the performance of MRI and 7 studies had reported the performance of CT, respectively. After pooling all studies, of CT, MRI, PET and PET/CT Forest plot of sensitivity and specificity of CT 0.77(0.71,0.82), 0.95(0.93,0.97) MRI 0.84(0.73,0.93), 0.850.78,0.91() PET 0.41(0.25,0.58) 0.96 (0.92,0.99) and PET/CT 0.85 (0.77,0.91) 0.95 (0.90, 0.98) in detecting recurrent gastric cancer and Peritoneal metastases in Gastric cancer with 95 % CI for each population of the included studies.

Forest plot for Lung cancer



Cumulative Sensitivity and specificity for Lung cancer



The Diagnostic test accuracy is represented by the summary statistics and summary line from four sets of basic data, namely true positive (TP), false positive (FP), false negative (FN), and true negative (TN). Representative summary statistics are the sensitivity,

specificity. Forest plot of sensitivity and specificity of detecting cervical cancer with PET with the 95 % CI for each population of the included studies. A total of 125 studies were included in this meta-analysis. Among them, 18 studies had reported the performance of PET, 82 studies had reported the performance of PET/CT, 5 studies had reported the performance of MRI and 20 studies had reported the performance of CT, respectively. After pooling all studies of CT, MRI, PET and PET/CT Forest plot of sensitivity and specificity of CT 0.71 (0.66, 0.75), 0.82 (0.80,0.85) MRI 0.65(0.59,0.71), 0.91(0.89,0.94) PET 0.83 (0.79, 0.86) 0.93 (0.91 0.95) and PET/CT 0.78(0.77, 0.80) 0.90(0.89, 0.90) in detecting mediastinal lymph node metastases, detecting stage IIIb, local T and N stage, M-stage lung cancer, solitary pulmonary nodule in lung cancer with 95 % CI for each population of the included studies.

V. DISCUSSION

This meta-analysis evaluates the diagnostic performance of PET, PET/CT, CT, and MRI on five different cancers cervical, breast, head and neck, gastric and lung cancer in detecting distant metastasis different staging and levels of cancer and local regional recurrence, lymph node metastases and peritoneal metastases. Diagnosis and detection of different cancers by PET, PET/CT, CT and MRI varies based on the region, recurrence and different stages of cancer [5-17]. We also found one HTA on cervical cancer and one HTA on lung cancer. The forest plot was plotted for all five different cancers with a total of 345 studies and their sensitivity and specificity was calculated. The pooled data for the cervical cancer with a sensitivity and specificity of CT 0.62 (0.57, 0.67), 0.92 (0.57, 0.67), MRI 0.52 (0.49,0.55), 0.96 (0.95, 0.96) PET 0.90 (0.86,0.93) 0.93(0.91, 0.94) and PET/CT 0.65(0.62, 0.68) 0.97(0.97,0.98) in detecting LN metastases cervical cancer Tumor staging like IA, IB II A, II B, III A and IV A in cervical cancer. The pooled data for the Breast cancer with a sensitivity and specificity of CT 0.87 (0.85, 0.89), 0.35 (0.33,0.38) MRI 0.97 (0.94, 0.98), 0.88(0.84, 0.91) PET 0.89 (0.86,0.90) 0.91(0.89, 0.93) and PET/CT 0.86(0.83, 0.88) 91(0.89, 0.93) in detecting local recurrences, lesion basis, distant metastases, and breast lesions in breast cancer. The pooled data for the head and neck cancer with a sensitivity and specificity of CT 0.81(0.77,0.85), 0.72(0.70, 0.74) MRI 0.77(0.74,0.79), 0.78(0.77,0.79) PET 0.20 (0.16, 0.25) 0.94(0.92, 0.96) and PET/CT 0.84(0.82,0.86) 0.88(0.86,0.89) in detecting lymph node metastasis, detection of recurrence in patients and detecting neck levels I, II, and III with head and neck cancer. The pooled data for the gastric cancer with a sensitivity and specificity of CT 0.77 (0.71,0.82), 0.95(0.93,0.97) MRI 0.84(0.73,0.93), 0.85 (0.78,0.91), PET 0.41(0.25,0.58) 0.96(0.92,0.99) and PET/CT 0.85 (0.77,0.91) 0.95 (0.90, 0.98) in detecting recurrent gastric cancer and peritoneal metastases in gastric cancer. The pooled data for the lung cancer with a sensitivity and specificity of CT 0.71 (0.66, 0.75), 0.82 (0.80, 0.85) MRI 0.65(0.59,0.71), 0.91(0.89,0.94) PET 0.83 (0.79, 0.86) 0.93 (0.91 0.95) and PET/CT 0.78(0.77, 0.80) 0.90(0.89, 0.90) in detecting mediastinal lymph node Metastases, detecting stage III b, local T and N stage, M-stage lung cancer, solitary pulmonary nodule in lung cancer.

VII. CONCLUSION

The Diagnostic test studies generally focus on accuracy, often in a population diagnosed with five different cancers. The impact of PET/CT, PET, MRI and CT on patients with Cervical cancer, Breast cancer, Head and Neck cancer, Gastric cancer and Lung cancer had shown better clinical effectiveness which can be used in healthcare system. In addition, several general analyses of the findings were conducted in this review, with the intention of comparing the differences between PET/CT, PET, MRI and CT.

PET/CT: It evaluates organs and tissues at a molecular level, identifies any abnormalities in cells, Detects early onset of cancer before it is visible with other imaging tools.

- It provides everything in a single scan.
- The combined PET/CT has proven to be a major advance for detection of primary tumors, distant metastases, recurrence after treatment, and for staging, restaging, and even monitoring therapy response in most cancers.

PET: PET scans show metabolic changes occurring at the cellular level in an organ or tissue.

- PET is used to reveal chemical and physiological changes in the body.

CT: The CT scan might show signs of cancer, but that cancer might not be active

- CT scan is unable to differentiate cancerous tissue from non-cancerous tissue, Therefore, CT scans can lead to a false negative.

MRI: MRI cannot differentiate between cancerous tissue and cysts (or fibroids).

- They do not clearly identify the location of all tumors in the body.

A meta-analysis was conducted for all 345 included studies and forest plot was plotted for Cervical cancer, Breast cancer, Oral cancer, Gastric cancer and Lung cancer. The meta-analysis uses more data and provides more reliable results. PET/CT for cervical cancer can often detect tiny metastatic LNs ranging in size from 5 to 9 mm, which cannot be diagnosed by MRI or CT [18]. In breast cancer according to [19] compared the performance in recurrent breast cancer patients using FDG-PET/CT and whole-body MRI and found that whole-body MRI showed a higher diagnostic accuracy of 94 versus 90% for FDG-PET/CT. The diagnostic accuracy of PET/CT for oral cancer in detecting distant metastasis and second primary tumors [20]. In gastric cancer the results show that FDG PET/CT shown the detection of recurrence and other stages of cancer. PET/CT in treatment response for lung cancer helps in early detection of recurrence or secondary primary malignancy.

VII. APPENDIX

Queries in PubMed		
Search	**Query**	**Items found**
#1	Search ((cervical cancer [MeSH Terms]) OR lymph node) [MeSH Terms]) OR pelvic [MeSH Terms]	644598
#2	Search (((positron emission tomography computed tomography [MeSH Terms]) OR PET/CT [MeSH Terms]) AND positron emission tomography [MeSH Terms]) OR PET [MeSH Terms]	2018
#3	Search (((sensitivity [MeSH Terms]) OR sensitiveness [MeSH Terms]) AND specificity [MeSH Terms]) OR particularity [MeSH Terms]	93255
#4	Search (((positron emission tomography computed tomography [MeSH Terms]) OR PET/CT [MeSH Terms]) AND computed tomography) OR CT	794002
#5	Search (((positron emission tomography computed tomography [MeSH Terms]) OR PET/CT [MeSH Terms]) AND magnetic resonance imaging [MeSH Terms]) OR MRI [MeSH Terms]	84060
#6	Search (((Breast cancer [MeSH Terms]) OR Mammary glands [MeSH Terms]) OR malignant [MeSH Terms]) OR tumor [MeSH Terms]	458529
#7	Search ((((((((((((Breast cancer [MeSH Terms]) OR Mammary glands [MeSH Terms]) OR malignant [MeSH Terms]) OR tumor [MeSH Terms]) AND positron emission tomography computed tomography [MeSH Terms]) OR PET/CT [MeSH Terms]) OR computed tomography [MeSH Terms]) OR CT [MeSH Terms]) OR positron emission tomography [MeSH Terms]) OR PET [MeSH Terms]) OR magnetic resonance imaging [MeSH Terms]) OR MRI [MeSH Terms]) AND Sensitivity [MeSH Terms]) AND specificity [MeSH Terms]	15513
#8	Search (((oral cancer) OR oropharyngeal cancer) OR Malignant) OR tumor OR Head and neck cancer	1693552
#9	Search ((((((((((((oral cancer [MeSH Terms]) OR oropharyngeal cancer [MeSH Terms]) OR Malignant [MeSH Terms]) OR tumor [MeSH Terms]) AND positron emission tomography computed tomography [MeSH Terms]) OR PET/CT [MeSH Terms]) OR computed tomography [MeSH Terms]) OR CT [MeSH Terms]) OR positron emission tomography [MeSH Terms]) OR PET [MeSH Terms]) OR magnetic resonance imaging [MeSH Terms]) OR MRI [MeSH Terms]) AND Sensitivity [MeSH Terms]) AND Specificity [MeSH Terms]	15513
#10	Search ((((Gastro intestinal cancer) OR gastric cancer) OR stomach cancer) OR malignant) OR tumour	727776
#11	Search ((((((((((((((Gastro intestinal cancer [MeSH Terms]) OR gastric cancer [MeSH Terms]) OR stomach cancer[MeSH Terms]) OR malignant[MeSH Terms]) OR tumor[MeSH Terms]) AND positron emission tomography computed tomography[MeSH Terms]) OR PET/CT[MeSH Terms]) OR computed tomography[MeSH Terms]) OR CT[MeSH Terms]) OR positron emission tomography[MeSH Terms]) OR PET[MeSH Terms]) OR magnetic resonance imaging[MeSH Terms]) OR MRI[MeSH Terms]) AND Sensitivity[MeSH Terms]) AND Specificity[MeSH Terms]	15513
#12	Search ((((Lung cancer) OR gastric cancer) OR lung carcinoma) OR malignant) OR Lung tumour	764656
#13	Search ((((((((((((((Lung cancer [MeSH Terms]) OR lung carcinoma [MeSH Terms]) OR lung tumour	16437

Queries in Cochrane		
Search	**Query**	**Items found**
#1	Search (cervical cancer):ti,ab,kw OR (lymph node)):ti,ab,kw OR (pelvic):ti,ab,kw	54321
#2	Search (positron emission tomography computed tomography):ti,ab,kw OR (PET/CT):ti,ab,kw AND (positron emission tomography):ti,ab,kw OR (PET):ti,ab,kw	24642
#3	Search (sensitivity) :ti,ab,kw OR (sensitiveness):ti,ab,kw AND specificity):ti,ab,kw	16617
#4	Search (positron emission tomography computed tomography):ti,ab,kw OR (PET/CT):ti,ab,kw AND (computed tomography):ti,ab,kw OR 9CT):ti,ab,kw	744256
#5	Search (positron emission tomography computed tomography):ti,ab,kw OR (PET/CT):ti,ab,kw AND magnetic resonance imaging):ti,ab,kw OR (MRI):ti,ab,kw	561469
#6	Search (Breast cancer):ti,ab,kw OR (Mammary glands):ti,ab,kw OR (malignant):ti,ab,kw OR (tumor):ti,ab,kw	37305
#7	Search (Breast cancer):ti,ab,kw OR (Mammary glands):ti,ab,kw OR (malignant))ti,ab,kw OR (tumor):ti,ab,kw AND (positron emission tomography computed tomography) :ti,ab,kw OR PET/CT):ti,ab,kw OR computed tomography):ti,ab,kw OR CT):ti,ab,kw OR positron emission tomography):ti,ab,kw OR PET):ti,ab,kw OR magnetic resonance imaging):ti,ab,kw OR MRI):ti,ab,kw AND Sensitivity):ti,ab,kw AND specificity):ti,ab,kw	116881

#8	Search (oral cancer)):ti,ab,kw OR oropharyngeal cancer)):ti,ab,kw OR Malignant)):ti,ab,kw OR tumor):ti,ab,kw OR Head and neck cancer)):ti,ab,kw	1693552
#9	Search (oral cancer):ti,ab,kw OR oropharyngeal cancer):ti,ab,kw OR Malignant):ti,ab,kw OR tumor):ti,ab,kw AND positron emission tomography computed tomography):ti,ab,kw OR PET/CT):ti,ab,kw OR computed tomography):ti,ab,kw OR CT):ti,ab,kw OR positron emission tomography):ti,ab,kw OR PET):ti,ab,kw OR magnetic resonance imaging):ti,ab,kw OR MRI):ti,ab,kw AND Sensitivity):ti,ab,kw AND Specificity):ti,ab,kw	561196
#10	Search (Gastro intestinal cancer)):ti,ab,kw OR gastric cancer)):ti,ab,kw OR stomach cancer) OR malignant)):ti,ab,kw OR tomor):ti,ab,kw	8087
#11	Search (Gastro intestinal cancer):ti,ab,kw OR gastric cancer):ti,ab,kw OR stomach cancer):ti,ab,kw OR malignant):ti,ab,kw OR tumor):ti,ab,kw AND positron emission tomography computed tomography):ti,ab,kw OR PET/CT):ti,ab,kw OR computed tomography):ti,ab,kw OR CT):ti,ab,kw OR positron emission tomography):ti,ab,kw OR PET):ti,ab,kw OR magnetic resonance imaging):ti,ab,kw OR MRI):ti,ab,kw AND Sensitivity):ti,ab,kw AND Specificity):ti,ab,kw	491396
#12	Search (Lung cancer)): ti,ab,kw OR Lung carcinoma)):ti,ab,kw OR lung tumour) OR malignant)):ti,ab,kw OR tumor):ti,ab,kw	6128
#13	Search (Lung cancer): ti,ab,kw OR Lung carcinoma):ti,ab,kw OR lung tumour):ti,ab,kw OR malignant):ti,ab,kw OR tumor):ti,ab,kw AND	581435

Google scholar:2430

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