بسم الله الرحمن الرحيم

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تم رفع هذه الرسالة بواسطة / مني مغربي أحمد

بقسم التوثيق الإلكتروني بمركز الشبكات وتكنولوجيا المعلومات دون أدنى مسئولية عن محتوى هذه الرسالة.

ملاحظات: لا يوجد

The Role of PET/CT in Assessment of Response to Treatment of Lymphoma

Thesis

Submitted for Partial Fulfillment of Doctorate Degree in Radiodiagnosis

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List of Abbreviations

Abb.	Name
^{18}F-FDG	^{18}F- FluoroDeoxyGlucose
ALP	Alkaline Phosphatase
AUC	Area Under The Curve
BM	Bone Marrow
CBC	Complete Blood Count
CECT	Contrast Enhanced CT
CHL	Classic Hodgkin lymphoma
CR	Complete Response
CT	Computed Tomography
dL	Deciliters
DWI	Diffusion-weighted Imaging
EBV	Epstein-Barr Virus
EOT	End of Treatment
ESR	Erythrocyte Sedimentation Rate
FL	Follicular Lymphoma
GFR	Glomerular Filtration Rate
HIV	Human Immunodeficiency Virus
HL	Hodgkin's Lymphoma
HRS	Hodgkin Reed-Sternberg
ICML	International Conference on Malignant Lymphoma
IHP	International Harmonization Project
IPS	International Prognostic Score
IQR	Interquartile Range

Abb.	Name
IRB	Institutional Review Board Approval
IV	Intravenous
KV	Kilo Volt
L&H Cells	Lymphocytic & Histiocytic Cells
LBM	Lean Body Mass
LDCHL	Lymphocyte Depleted Classic Hodgkin lymphoma
LDH	Lactate Dehydrogenase
LNs	Lymph Nodes
LP	Lymphocyte Predominant
LRCHL	Lymphocyte Rich Classic Hodgkin lymphoma
MA	Milliamper
MCCHL	Mixed Cellularity Classic Hodgkin lymphoma
MCi	Micro Curies
MIP	Maximum Intensity Projection
ml	Milliliter
Mm	Millimeter
MRI	Magnetic Resonance Imaging.
MTV	Metabolic Tumor Volume
MZBCL	Marginal Zone B Cell Lymphoma
NAD+	Nicotinamide Adenine Dinucleotide Oxidized
NADH	Nicotinamide Adenine Dinucleotide Reduced
nCR	Non Complete Response
NHL	Non-Hodgkin's Lymphoma
NPV	Negative Predictive value

Abb.	Name
NSCHL	Nodular Sclerosis Classic Hodgkin lymphoma
PA	Postero-anterior
PET	Positron Emission Tomography
PPD	Product of Perpendicular Diameters
PPV	Positive Predictive Value
RECIL	Response Evaluation Criteria in Lymphoma
RECIST	Response Evaluation Criteria in Solid Tumors
ROI	Region of Interest
R_S	Spearman rank correlation coefficient
SUV	Standardized Uptake Value
SUVmax	Maximum Standardized Uptake Value
TLG	Total Lesion Glycolysis
US	Ultrasound
WBMTV	Whole Body Metabolic Tumor Volume
WBTLG	Whole Body Total Lesion Glycolysis
WHO	World Health Organization
X^2	Chi-square
µL	Micro liters

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Introduction

Lymphomas are one of the most common solid tumors. They are divided into two main categories, Hodgkin's lymphoma (HL) and non-Hodgkin's lymphoma (NHL) ***(Singh et al., 2020)*.**

Nowadays, ^{18}FDG PET/CT plays a great role in its management with various applications like staging and evaluation of individual chemosensitivity to treatment and subsequently to adapt further therapy. Universally, response assessment of lymphoma has mostly been achieved using visual criteria, Deauville five-point scale, that became the international standard in 2014 ***(Voltin et al., 2020)***.

Functional quantitative parameters studies play a great role in oncologic management. The universal metabolic quantitative parameter is the SUVmax, which represents the maximum voxel value of SUV in the tumor reflecting the tumor glucose metabolism of the most aggressive cell component ***(Im et al., 2018)***. However, SUVmax value is retrieved from only one voxel which makes it sensitive to image noise. Therefore, it is impacted by various patient characteristics and imaging parameters being variable with partial volume effect, body composition, uptake period, and plasma glucose level, or

mixed effects. On the other hand, MTV is a measurement of the viable tumor fraction, and can better estimate tumor burden. The product of multiplying the mean SUV and the MTV, yields the TLG representing the metabolic burden of disease that depends on both tumor volume and glucose utilization rate. Thus MTV or TLG may provide additional valuable information for prediction of tumor reaction to treatment ***(Xie et al., 2016)***. Most studies are concerned with whole body MTV (WBMTV) and whole body TLG (WBTLG), with few available studies on target lesions' MTV and TLG.

In this study, our goal was to determine the predictive value of both MTV and TLG of target lesions instead of WBMTV and WBTLG (which are time consuming and need advanced software) by using the new Response Evaluation Criteria in Lymphoma 2017 to improve PET-CT ability in response assessment to treatment ***(Younes et al., 2017)***.

Moreover, although the availability of many studies searching the association between TLG and MTV with LDH in various malignancies and lymphoma types; yet, there were few available studies concerning HL ***(Li et al., 2019)***. We investigated the correlation of TLG and MTV with serologic tumor marker LDH in HL patients.

Aim of the Work

The aim of this study is to explore the prognostic value of PET/CT in Hodgkin lymphoma.