شبكة المعلومات الجامعية

التوثيق الإلكتروني والميكروفيلم

بسم الله الرحمن الرحيم

HANAA ALY

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قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
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HANAA ALY

Study of The Relation between 8_Hydroxy-2'-deoxyguanosin (8_OHDG) and Suspicious Thyroid nodule in a Patients with Multinodular Goiter

Thesis

Submitted for partial fulfillment of Master Degree in Endocrinology and Metabolism

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Ruwaida Fouli Farag Mohamed Eljazwi

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List of Abbreviations

Abbr.	Full-term
AFTNs	: Autonomously functioning thyroid nodules
ATA	: American Thyroid Association
cAMP	: cyclic adenosine monophosphate
CT	: Computed tomography
EGF	: Epidermal growth factor
ETA	: European thyroid association
FNA	: Fine needle aspiration
FNAB	: Fine needle aspiration biopsy
GCMS	: Gas chromatography with mass spectrometry
GC-MS	: Gas-chromatography-massspectrometry
GPXs	: Glutathione peroxidases
H&E	: Hematoxylin and eosin
H2O2	: Hydrogen peroxide
hOGG1	: 8-oxoguanine DNA glycosylase
HPLC	: High-performance liquid chromatography
IGF-I	: Insulin-like growth factor-1
MNG	: Multinodular goiters
MRI	: Magnetic resonance imaging
mRNA	: Messenger ribonucleic acid
MTC	: Medullary thyroid carcinoma
MTNS	: McGill Thyroid Nodule Score
NIS	: Na+/I− symporter
PET	: Positron emission tomography

PTC	**:**	Papillary thyroid carcinoma
ROS	**:**	Reactive oxygen species
SD	**:**	Standard deviation
SOD	**:**	Superoxide dismutase
Tg	**:**	Thyroglobulin
TGF-ß1	**:**	Transforming growth factor
TIRADS	**:**	Thyroid Imaging Reporting and Data System
TPO	**:**	Thyroid peroxidase
TSH	**:**	Thyroid stimulating hormone
8-OHDG	**:**	8_Hydroxy-2'-deoxyguanosin
8-OHGua	**:**	C8-hydroxyguanine

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Introduction

Thyroid nodules are a common clinical problem affecting numerous individuals worldwide. The prevalence of palpable thyroid nodules is approximately 5% among women and 1% among men living in iodine-sufficient parts of the world **(Haugen et al., 2016).**

High-resolution ultrasound can detect thyroid nodules in 19%–68% of randomly selected individuals, with higher frequencies in women and the elderly **(Tan and Gharib. 1997)**.

Although the majority of thyroid nodules are benign, certain risk factors, such as a solid nodule, age over 70 years or below 20 years, a history of previous head and neck irradiation, male sex, and a history of familial thyroid cancer or multiple endocrine neoplasia syndrome, may increase the risk of developing cancerous thyroid nodules **(Arora et al., 2008)**.

Multinodular goiters (MNG) defined as an enlarged thyroid gland with multiple nodules, have historically been thought of as a benign condition with a low risk of associated malignancy, and may be present in up to 4% of the population in iodine sufficient countries. However, recent studies have suggested that the incidence of malignancy in patients with MNG approaches that of patients with a solitary thyroid nodule **(Gandolfi et al., 2004)**.

Pre-operative diagnosis of thyroid cancer is commonly done through fine-needle aspiration (FNA) While it remains one of the best pre-operative methods of determining nodule malignancy, large studies have found FNAs to be non-diagnostic in up to 25% of the cases **(Rago et al., 2010)**. Furthermore, the presence of multiple nodules can present difficulties in adequately evaluating the entire thyroid because sampling every nodule is not practical **(Ríos et al., 2004).**The presence of multiple nodules also creates challenges in following individual nodules for growth overtime, which is an additional factor that is used to increase the suspicion for malignancy.

Early molecular conditions for nodular and tumor transformation in the thyroid gland consist of a sequence of molecular events that include oxidative stress and DNA damage as the trigger for somatic mutations. The oxidative burden is already detectable in the normal thyroid gland and is likely to be linked to hormone synthesis and H2O2 production **(Guth et al., 2009)**. It has been suggested that oxidative stress can cause DNA damage followed by an increase in the spontaneous mutation rate, which is a platform for tumor genesis **(Levine and Sistrunk. 2018)**.