بسم الله الرحمن الرحيم

MONA MAGHRABY

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

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جامعة عين شمس

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قسم

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علي هذه الأقراص المدمجة قد أعدت دون أية تغيرات

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MONA MAGHRABY

Prediction Equation for Spirometric Parameters in Cairo Governorate Adult Population

Thesis

*Submitted for the Partial Fulfillment of the Master Degree in **Chest Diseases***

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Omar Mohamed Ahmed

List of Contents

List of Tables

List of Tables cont...

List of Figures

List of Abbreviations

Abb.	Full term
ATS-ERS	American Thoracic Society and the European Respiratory Society
CT	Computerized tomography
FEF	Forced mid-expiratory flow rate
FEV_1	Forced expiratory volume in the first second
FVC	Forced vital capacity
L/S	Liters/seconds
MRI	Magnetic resonance imaging
MVV	Maximal voluntary ventilation
PEF	Peak expiratory flow
PEFR	Peak expiratory flow rate
TV	Tidal volume
VC	Vital capacity

INTRODUCTION

Spirometry is a vital investigation carried out by most pulmonologists. Interpretation of spirometry data classifies the severity of the underlying obstructive or restrictive abnormality. However, the interpretation of normal and disease depends on the predicted values. The predicted values depend mainly on anthropometry parameters, gender and ethnicity, though environmental, genetic, socioeconomic, and technical factors also contribute ***(Chhabra, 2009).***

Spirometry is the most frequently performed lung function test. The predicted values depend mainly on anthropometry parameters, gender and ethnicity, though environmental, genetic, socioeconomic and technical factors also contribute. Wide variations have been observed in diverse ethnic groups. Reference formulas are used to determine a normal range of spirometry results. Reference values play an important role in establishing the volumes measured in an individual fall within a range to be expected in a healthy person of the same gender, height, age and geographic location ***(Ostrowski et al., 2005).***

Desai et al. (2016) developed prediction equations for spirometry parameters for the western Indian population. Proposing updated regression equations for spirometric variables for the adult population is useful in management of patients with respiratory diseases. Various factors interplay a role in the vast variations of lung functions. They suggested significant correlation of the weight parameter with FVC, FEV1, and PEFR.

AIM OF THE WORK

(1) To develop prediction equations for pulmonary function parameters in a sample of the adult Egyptian population of Cairo governorate.

(2) To compare them with international reference figures used in our spirometric lab facilities.

REVIEW OF LITERATURE

Pulmonary Function Tests

Pulmonary function tests in pediatric age group are an essential component of the diagnosis and monitoring of different pulmonary disease process. It is often claimed that assessment of the pulmonary function tests will help diagnosis, assist prognosis, and monitor disease progress and measure the effect of the therapeutic intervention ***(Hammer and Eber, 2005).*** Evaluating lung function in this age group is important, not only for clinical reasons, but also due to the considerable growth and development of the respiratory system that occurs, with associated changes in lung mechanics ***(Beydon et al., 2007).***

Mechanical properties of the respiratory system:

The total volume of gas in the lungs is conventionally subdivided into compartments (volumes) and combinations of two or more volumes (capacities).

1. Static lung volumes:

Table 1: Lung volumes and capacities ***(Wanger et al., 2005)***

Term	Symbol	Definition
Tidal Volume	T.V	The volume of air inspired or expired with ten normal quite breath.
Inspiratory reserve volume	IRV	The air inspired with maximal inspiratory effort in excess of tidal volume.
Expiratory reserve volume	ERV	The volume expelled by an active expiratory effort after passive expiration
Residual volume	R.V	The air left in the lungs after maximal expiratory effort.
The functional residual capacity	FRC	The volume at the end of quite tidal expiration it equals R.V plus ERV.
The inspiratory capacity	IC	The maximal volume of air that can be inhaled from the end of quiet tidal expiration. It equals T.V plus IRV.
The vital capacity	VC	The largest amount of air that can be expired after a maximal inspiratory effort. It equals IRV plus ERV.
Total lung capacity	TLC	The volume of air expanding the lung with the greatest possible inspiratory effort it equals V.C plus R.V.