# بسم الله الرحمن الرحيم

**HANAA ALY**

# شبكة المعلومات الجامعية

# التوثيق الالكتروني والميكروفيلم

*HANAA ALY*

# جامعة عين شمس

## التوثيق الإلكتروني والميكروفيلم

## قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
علي هذه الأقراص المدمجة قد أعدت دون أية تغيرات

## يجب أن

تحفظ هذه الأقراص المدمجة بعيدا عن الغبار

# HANAA ALY

# Left Ventricular Function in Recovered COVID 19 Patients using 4 Dimension Echocardiography and Conventional Echocardiography

Thesis

Submitted for Partial Fulfillment
of Master Degree in **Cardiology**

By

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بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

# قَالُوا

سبحانك لا علم لنا
إلا ما علمتنا إنك أنت
العليم الحكيم

صدق الله العظيم

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*Aly Osama Abdelhady Elsayed*

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# List of Abbreviations

| Abb. | Full term |
|------|-----------|
| 2d | Two dimension |
| 4d | Four dimension |
| ACE | Angiotensin converting enzyme |
| BSA | Body surface area |
| CBC | Complete blood picture |
| CVD | Cardio vascular disease |
| EDD | End diastolic dimensions |
| EDV | End diastolic volume |
| ESD | End systolic dimensions |
| ESV | End systolic volume |
| FAC | Fractional area change |
| GLS | Global longitudinal strain |
| HF | Heart failure |
| HGB | Hemoglobin |
| IL6 | Interleukin 6 |
| LAV | Left atrium volume |
| LV | Left ventricle |
| LVEF | Left ventricle ejection fraction |
| MCP | Monocyte chemoattractant protein |
| PLT | Platelets |
| PWD | Pulse wave Doppler |
| RAAS | Renin angiotensin aldosterone system |
| RT3D | Real time three dimensional |
| TAPSE | Tricuspid annular plane systolic excursion |
| TDI | Tissue Doppler imaging |
| TLC | Total leucocytic count |
| TNF | Tumor necrosing factor |
| TR | Tricuspid regurgitation |

# INTRODUCTION

A Corona virus diseases (COVID 19) is defined an illness caused by a novel corona virus called severe acute respiratory distress syndrome corona virus 2 (SARS COV 2) it was first identified as outbreak as respiratory illness in Wuhan City and later on March 11,2020 and later it was declared as global pandemic.

Presentations of COVID -19 ranged from asymptomatic mild cases up to sever cases which leads finally to death.

Symptoms may develop from 2 days up to 2weeks after exposure. Fever is the most common symptom of COVID-19, other common symptoms include cough, loss of appetite, fatigue, shortness of breath, sputum production, fatigue, diarrhea. Less common symptoms include runny nose, sore throat, skin lesions.

There are several testing protocols for the disease, The standard method is real time reverse transcription polymerase chain reaction (rRT-PCR) . Also Chest CT scans may be done.

The impact of COVID 19 on the Heart is largely unknown but it is at higher risk of failure. Increased afterload from pulmonary embolism, negative inotropic effects of cytokines, and direct angiotensin converting enzyme 2-mediated cardiac injury from COVID 19 are potential mechanisms that can affect the heart [1].

But Right now Little is known about the cardiac manifestations of COVID-19 because all the data gathered until now were based on laboratory and clinical evaluation or case reports in deteriorating patients We need more follow-up research on the patients that recovered from their illness, to assess the short- and long-term clinical implications of cardiac disease in COVID-19 and to assess for the pathogenesis of RV dysfunction in this disease.

Evaluation of left ventricular size and function are the most common reasons for performing echocardiography in the adult patient. Important diagnostic, prognostic, and treatment decisions depends on LV morphology analysis; the widespread bedside availability, cost, and non-invasive nature of echocardiography means that this technique has become the method of choice in most situations for performing this analysis. However, both M mode and two dimensional (2D) echocardiography make important geometric assumptions about the LV which leads to inaccuracies in measurements. Many echocardiographic departments perform "eyeball" analysis of global and regional LV function and provide visual estimates of ejection fraction because existing quantification methods (from M mode and 2D Echo) are both time consuming and difficult to perform. In an era when so many important and often costly decisions are made upon these data it is incumbent upon departments that accurate and reproducible echo quantification methods are utilised—especially since the "gold standard"

technique of cardiac magnetic resonance (CMR) is not so widely available, is more costly, cannot be used on those with implanted pacemakers or defibrillators, and is disliked by many patients.

Real Time Three dimensional (RT3D) echocardiography has been available for several years using time consuming and difficult reconstruction techniques (often utilizing transoesophageal studies). However, recent advances in computer processing and transducer construction techniques have meant that real time transthoracic 3D echocardiography is now available from major ultrasound system manufacturers. Software programs to analyse 3D datasets of the LV are also now readily available; this combination of new instrumentation and software has been shown to provide highly accurate (compared to CMR) analysis of LV morphology and function, such that this methodology is likely to ensure that echocardiography remains the first choice technique for non-invasive evaluation of the LV.

# AIM OF THE WORK

Aim of the Work is to study the effect  of COVID 19 on Left Ventricular Function and dimensions using 4D Echocardiography in recovered patients.