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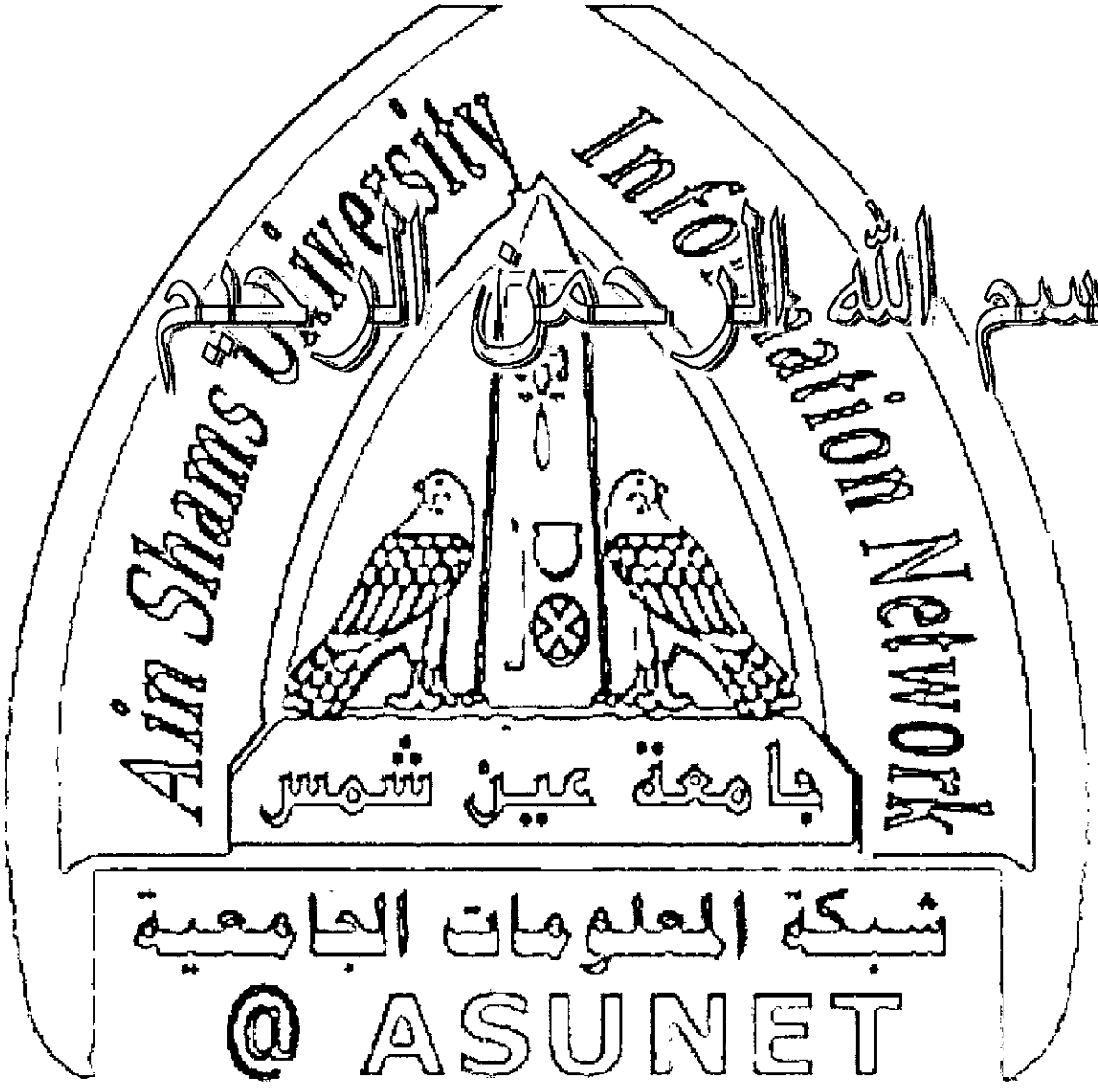

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التوثيق الالكتروني والميكروفيلم

قسم

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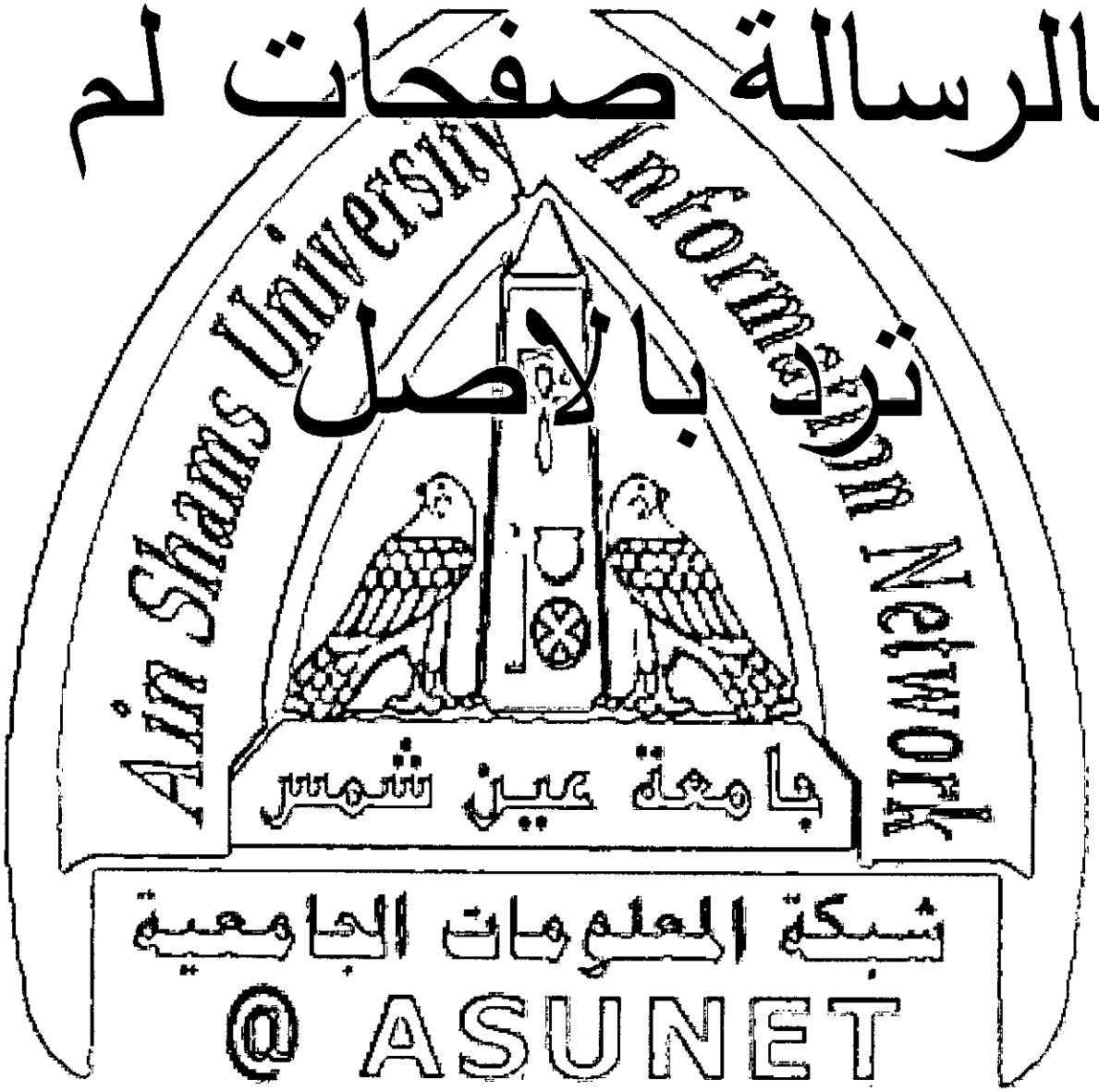

Global and regional cardiac performance in infants and children with acute pneumonia

Thesis

Submitted To the Faculty of Medicine Tanta University in partial fulfillment of the requirement of Master Degree

In

Pediatrics

By

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Abstract

Pneumonia affects cardiac function through invasion of microorganisms, toxic effect and hypoxia causing myocarditis, also causing pulmonary hypertension in severe cases pneumonia.

This prospective study was conducted on twenty patients aging from two months to thirteen years who were classified according to severity of pneumonia into pneumonia (15) and severe pneumonia (5); and subjected to full clinical history, Thorough clinical examination, Chest X-ray, Echocardiography and Doppler tissue imaging during illness and after clinical recovery, Complete Blood Count (CBC), Serum Electrolytes (Na, K, Ca), Renal Function tests (urea & creatinine), Liver Function tests (ALT & AST), CRP (C-reactive protein), Arterial Blood Gases during illness and after clinical recovery, Serum Creatinine Kinase MB fraction (CK-MB) and Serum Lactate Dehydrogenase (LDH).

Cases of pneumonia showed diastolic dysfunction of LV and RV during illness which improved after recovery by conventional echocardiography; but by DTI showed diastolic dysfunction during illness and after recovery.

Severe pneumonia cases showed LV and RV systolic dysfunction by DTI; but normal FS by conventional echocardiography, also diastolic dysfunction of LV and RV during illness and after recovery by conventional echocardiography; but more significant decrease of during illness and after recovery by DTI.

Pulmonary artery systolic pressure significantly increased in cases of severe pneumonia and returned to normal values after clinical recovery, pulmonary acceleration time significantly decreased in cases of pneumonia and returned to normal values after clinical recovery. In severe pneumonia it was significantly decreased during illness and after clinical recovery, also ABG showed hypoxemia during illness and became normal after recovery; but cardiac enzymes were normal

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PCR	Polymerase chain reaction.
RSV	Respiratory syncytial virus.
FBC	Full blood count.
CRP	C - reactive protein.
PVR	Pulmonary vascular resistance.
P_{pa}	Pulmonary capillary pressure.
P_A	Pulmonary alveolar pressure.
P_{PV}	Venous pressure.
P_{isf}	Pulmonary interstitial pressure.
FRC	Functional residual capacity.
V/Q	Ventilation perfusion ratio.
P_aO_2	Arterial oxygen tension.
P_aCO_2	Arterial carbon dioxide tension.
LVEDd	Left ventricular end diastolic diameter.
LVESd	Left ventricular end systolic diameter.
RVEDd	Right ventricular end diastolic diameter.
RVESd	Right ventricular end systolic diameter.
FS	Fraction shortening.
EF	Ejection fraction.
E wave	Early filling.
A wave	Atrial contraction.
DT	Deceleration time.
IVRT	Isovolumic relaxation time.
QS	Systemic flow.

QP	Pulmonary flow.
ECG	Electro cardiogram.
LVOTVI	Left Ventricular outflow time velocity interval.
MVTVI	Mitral valve time velocity interval.
LVOT	Left ventricular outflow tract.
RVSP	Right ventricular systolic pressure.
PASP	Pulmonary artery systolic pressure.
PW-DTI	Pulsed wave Doppler tissue imaging.
DTI	Doppler tissue imaging.
RVEF	Right ventricular ejection.
TVI	Time Velocity Integral.
RIVRT	Right isovolumic relaxation time.
E´ Wave	Early annular diastolic velocity.
A´ Wave	Late annular diastolic velocity.
S Wave	Peak annular systolic velocity.
LDH	Lactate dehydrogenase.
CK-MB	Creatinine kinase M-B fraction.
Pulmonary R-R	Pulmonary acceleration time.

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Introduction

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Pneumonia is an important cause of death in childhood, especially in infancy period. According to the World Health Organization (WHO) data, 3– 5 million children under five years die each year from this disease [1].

The cardiovascular and respiratory systems function as a single unit and cannot be thought of independently. Alterations in cardiorespiratory interactions can cause significant changes in cardiac functions. Cardiac failure is a serious complication of pneumonia and may also contribute to mortality [1], [2].

Acute lower respiratory tract infections could alter the cardiovascular performance in several ways, including hypoxia and invasion of micro- organisms, resulting in myocarditis [1].

Right ventricular failure is common in children with severe pneumonia and it is probably caused by pulmonary hypertension rather than septic toxemia. The degree of increase in pulmonary arterial pressure was related to the severity of pneumonia. Pulmonary artery pressure measured by Doppler echocardiography [2], [3].

Conventional echo Doppler examination can asses global ventricular function and can detect advanced significant ventricular dysfunction; but cant detect early and mild abnormalities [4].

Recent investigations have introduced a Doppler tissue imaging (DTI) echocardiography as a new non invasive and simple method for assessing ventricular systolic and diastolic functions that can solve the limitations of the traditional methods in evaluating ventricular function [5].