ECG Changes in Acute Severe Asthma

Thesis

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List of Abbreviations

Abb.	Full term
ADAM33	Adesintergrin and metalloproteinase 33
AHR	Airways hyperresponsiveness
AV	Atrioventricular
Bpm	Beat per minute
cAMP	Cyclic adenosine monophosphate
DPPA	Dipeptidyl peptidase 10
ECG	Electrocardiography
ET	Ejection time
ET-1	Endothelin
ETS	Environmental tobacco smoke.
FEV_1	Forced expiratory volume in 1 sec
FVC	Forced vital capacity
GINA	Global Initiative for Asthma,
GPRA	G-protein related receptor for asthma
HR	Heart rate
ICSs	Inhaled corticosteroids
IFN-α	Interferon-α
IgE	Immunoglobulin E
IL	Interleukin
IQR	Interquartile range
IV	Intravenous
IVCT	Isovolumetric contraction time
IVRT	Isovolumetric relaxation time
LABA	Long-acting beta2-agonists
LQTS	Long QT Syndrome
LTRA	Leukotriene receptor antagonist
LV	Left-ventricle
MCBN	Myocardial contraction band necrosis
Mg	Magnesium
MPI	Myocardial performance index
PAC	Premature atrial contraction

List of Abbreviations

Abb.	Full term
PaCO$_2$	Carbon Dioxide Pressure
PHF11	Plant homeodomain zinc finger protein 11
pMDI	Pressurized metered dose inhalers
PSAP	Pulmonary systolic arterial pressure
P-value	Probability
PVC	Premature ventricular contraction
RAD	Right axis deviation
RAP	Right atrial pressure
RBBB	Right bundle branch block
RR	Respiratory rate
RV	Right-ventricle
RVH	Right ventricular hypertrophy
SA	Sinoatrial
SABA	Short-acting B2 agonist
SD	Standard deviation
SPINK5	Serine protease inhibitor Kazal type 5
SVT	Supraventricular tachycardia
TDE	Tissue Doppler Echocardiography
TFPV	Transmitral flow propagation velocity
Th	T helper
TNF-α	Tumor necrosis factor-alpha
URTI	Upper respiratory tract infection
VBG	Venous blood gases

INTRODUCTION

Asthma is considered a heterogenous disease, characterized by chronic inflammation of the airways resulting in airflow obstruction, which may completely or partially reverse with or without specific therapy. Airway inflammation is the result of interactions between various cells, cellular elements, and cytokines *(Holgate and Polosa, 2008).*

Bronchial asthma is one of the most common chronic inflammatory disorders of childhood. The prevalence of bronchial asthma has further increased over the last decades, especially so in children, and still there is no sound explanation for this increase *(Akinbami et al., 2009).*

In susceptible individuals, airway inflammation may cause recurrent or persistent bronchospasm, which causes symptoms that include wheezing, breathlessness, chest tightness, shortness of breath and cough, particularly at night (early morning hours) or after exercise *(Hargreave, 2009).*

It imposes a serious burden on patients, their family and the community. It causes respiratory symptoms, limitation of activities and flare ups, that sometimes require immediate medical attention and may be fatal *(Global initiative for asthma, 2006).*

Although bronchial asthma has been accused in causing arrythmias and affecting the cardiac function and anatomy

especially during the acute exacerbation attacks, there isn't much literature available discussing its effect on the heart, its function and electrophysiology *(Shedeed, 2010).*

It is essential to study the role of bronchial asthma in cardiac dysfunction, this will not only help clinicians to assess the risk of death and institute the appropriate level of care, but it will also help to explain the mechanism of death and to guide for other treatment *(Salpeter et al., 2004).*

AIM OF THE WORK

This work was done to study the various ECG abnormalities in acute asthma as well as the relation between the ECG abnormalities with severity of airway obstruction. Furthermore, the work included the effect of bronchodilators used on the ECG and their potential reversibility after the acute episode.