EXPRESSION OF TRANSFORMING GROWTH FACTOR β_1 IN INDUCED SPUTUM OF ASTHMATIC CHILDREN

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ABSTRACT

This study suggests that transforming growth factor- β_1 may play a role in regulation of disease activity and the level of TGF- β_1 in induced sputum may be a marker of asthma control this is a prospective randomized clinico-laboratory study which was conducted on 40 asthmatic children and 40 age and sex matched normal children as a control group.

KEY WORDES

Expression

Growth

Children

LIST OF ABBREVIATION

AEC	:	Absolute eosinophile count.
AHR	:	Airway hyperresponsiveness.
BAL	:	Broncho alveolar lavage.
BMP	:	Bone morphogenetic.
COPD	:	Chronic obstructive pulmonary disease.
$CPLA_2$-α	:	Cytosolic phosphlipase A_2 alpha.
CTGF	:	Connective tissue growth factor.
DALYS	:	Disability – adjusted life years.
ECM	:	Extra cellular matrix.
EGF	:	Epidermal growth factor.
ELISA	:	Enzyme – linked immuno sorbent assay.
ERK	:	Extra cellular regulated protein kinase
FEV_1	:	Forced expiratory volume in 1 second.
FVC	:	Forced vital capacity.
GM-CSF	:	Granulocyte macrophage-colony stimulating factor.
HDM	:	House dust mite.
HPA	:	Hypothalamic-pituitary Adrenal.
ICS	:	Inhaled corticosteroid.
IFN-α	:	Interferon-α
MDC	:	Macrophage – derived chemokines.
MDI	:	Metered-dose inhaler.
MHC	:	Major histocompatibility complex.
MMP	:	Matrix metalloproteinase.
MUC	:	Mucin glycoproteins.
NO	:	Nitric oxide.
O.D	:	Optical density.
PAI	:	Plasminogen activator inhibitor.
PEF	:	Peak expiratory flow.

LIST OF ABBREVIATION (cont...)

PPAR	:	Peroxisome proliferators activated receptor.
RSV	:	Respiratory syncytial virus.
SD	:	Standard deviation.
SMA	:	Smooth muscle actin,
STRAP	:	Serine-threonine kinase receptor-associated protein.
TARC	:	Thymus activation regulated chemokines
TGF-β_1	:	Transforming growth factor-β_1
Th_1	:	T helper 1
Th_2	:	T helper 2
TIMP	:	Tissue inhibitors of matrix metallopoteinas.
VNTR	:	Variable number of tandem repeats.

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INTRODUCTION

Bronchial asthma is one of the commonest diseases in children and its prevalence is increasing in developing world. Affecting around 10% of the world's population *(Shahana et al., 2005)*.

Asthma is characterized by chronic lung inflammation and airway remodeling *(Wark et al., 2005)*, as shown by subepithelial fibrosis, myofibroblast hyperplasia, myocyte hyperplasia and hypertrophy together with epithelial damage, goblet cell metaplasia, oedema and increased vascularity *(Woodruff et al., 2004)*.

Transforming growth factor-β_1 (TGF- β_1) is a potent profibrogenic factor whose expression is increased in the asthmatic airways and is prime candidate for the initiation and persistence of airway remodeling in asthma *(Fedorov and Wilson et al., 2004)*. TGF- β_1 is released from damaged epithelial cells and can mediate its effects by interacting with TGF-β_1 receptors on fibroblast which promote the transformation of fibroblasts into myofibroblasts resulting in remodeling of the airway *(Huang et al., 2004)*.

Several reports have demonstrated that eosinophils in the airway mucosa represent a major source of TGF-β_1 *(Minshall et al., 1997)*. Furthermore, expression of TGF-β_1 is evident in

circulating esoinophils from hypereosinophilic individuals *(Wong et al., 1991)*. Since bronchial asthma is associated with eosinophilic infiltration and activation in the airways, the expression of TGF-β_1 by these cells may results in fibroblast activation and collagen deposition seen in this disease. It has been shown that bronchial biopsy tissues from severe asthmatics over expressed TGF-β_1 mRNA more than normal subject and the main source of the mRNA was eosinophils *(Ohno et al., 1996)*. In addition, TGF-β_1 I levels in the broncho alveolar lavage (BAL) fluid are elevated in atopic asthmatics and these levels increased in response to allergen exposure *(Redington et al., 1997)*.

Induced sputum is a useful non-invasive technique to study airway inflammation in asthma. The clinical importance of TGF-β_1 levels in induced sputum samples of asthmatic children has been poorly studied.

AIM OF THE WORK

The aim of this work is to determine TGF-β_1 levels in induced sputum samples from asthmatic children, as well as non asthmatic children in order to:

1- Assess the potential role of TGF-β_1 in the pathogenesis of asthma.

2- Investigate the association between TGF-β_1 levels and the baseline lung function, the number of eosinophils in induced sputum samples, and other clinical indices.