
The Reliability of Candida Skin Test in Investigating Tcell function in Infants

Thesis

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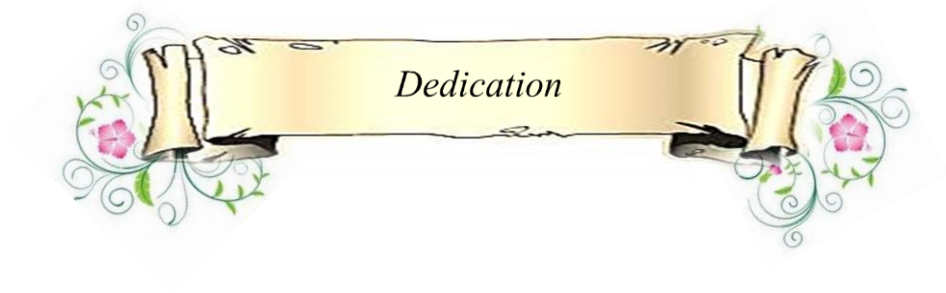
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List of Abbreviations

| | | |
|-------------------|---|--|
| ADA | : | adenosine deaminase assay |
| ALC | : | absolute lymphocyte count |
| ANC | : | absolute neutrophil count |
| APCs | : | antigen presenting cells |
| BCG | : | Bacillus Calmette-Guerin |
| C.albicans | : | candida albicans |
| CBC | : | complete blood count |
| CCR | : | chemokine receptor |
| CDs | : | cluster of differentiation |
| CFSE | : | carboxyfluorescein succinimidyl ester |
| CMF-PBS | : | calcium and magnesium free phosphate buffered saline |
| CO2 | : | carbon dioxide |
| CON A | : | concanavalin A |
| Cr51 | : | chromium 51 release assay |
| CTLs | : | cytotoxic T lymphocytes |
| CXCR5 | : | cysteine-x-cysteine motif receptors 5 |
| DN | : | double negative |
| DP | : | double positive |
| DTH | : | delayed type hypersensitivity |
| EDTA | : | ethylene diamine tetraacetic acid |
| ELISA | : | enzyme linked immunosorbent assay |
| ELISPOT | : | enzyme linked immunospot |
| FBS | : | fetal bovine serum |
| H1N1 | : | hemagglutinin 1 and neuraminidase 1 |
| Hb | : | Haemoglobin |

| | | |
|----------------------------------|---|--|
| HSC | : | haematopoietic stem cells |
| IL | : | Interleukin |
| INF-γ | : | interferon gamma |
| INF-γ R | : | interferon gamma receptor |
| IOR | : | interquartile ranges |
| JAK | : | janus kinases |
| LFα | : | lymphotoxin alpha |
| MCV | : | mean corpuscular volume |
| MHC | : | major histocompatibility complex |
| MNCs | : | mononuclear cells |
| MPPs | : | multipotent progenitors |
| mTECs | : | medullary thymic epithelial cells |
| NK | : | natural killer cells |
| OD | : | optical density |
| PBS | : | phosphate buffered saline |
| PHA | : | phytohemagglutinin |
| PLT | : | Platlets |
| PNL | : | polymorphonuclear leukocytes |
| PNP | : | purine nucleoside phosphorylase |
| PPD | : | purified protein derivative |
| RPMI | : | Roswell Park Memorial Institute |
| SCID | : | severe combined immunodeficiency |
| SD | : | standard deviation |
| STAT | : | signal transducer and activator of transcription |
| T reg | : | T regulatory cells |
| TCR | : | T cell receptor |
| TEM | : | effector memory T cell |
| Tfh | : | T follicular helper cells |

| | | |
|-----------------|---|---|
| TGF-beta | : | transforming growth factor beta |
| Tr1 | : | type 1 regulatory T cell |
| TRECs | : | T cell receptor excision circles |
| TSAs | : | tissue specific self antigens |
| V(D)J | : | variable diversity joining |
| WBCs | : | white blood cells |
| ZAP-70 | : | zeta chain associated protien kinase 70 |

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INTRODUCTION

T cells and cell mediated immunity constitute one of two major cellular components of the adaptive immune response. The function of T cells is to recognize specific “non-self” antigens, during a process known as antigen presentation, leading to generation of specific responses that are tailored to maximally eliminate specific pathogens or pathogen-infected cells (Ballou, 2014).

Measurement of cell-mediated immunity can be undertaken by both in vitro and in vivo methods. It is, however, more problematic than humoral assessment as assays are plagued by difficulties in standardisation, biological variability, imprecision and technical complexity. Most tests are highly specialised and referral to a clinical immunologist is recommended (Limaye, 2010).

Delayed-type hypersensitivity skin testing provides a functional in vivo assessment of cellular immunity. The skin response following intradermal inoculation of antigen is dependent on antigen-specific memory T cells and results in local inflammation after 48–72 hours due to the recruitment of mononuclear cells (lymphocytes, monocytes) and neutrophils

(Limaye, 2010). Both standardized and non standardized candida intradermal skin tests are used in clinical practice with variable results (Ohri and Omaha, 2004; Yeo et al., 2009).

AIM OF THE WORK

This study is aimed to investigate the reliability of candida skin test in evaluation of T cell function in comparison to in-vitro assessment of T cell function in a group of healthy Egyptian infants using the manually prepared Candida intra-dermal skin test.

The ultimate objective is to validate the use of this test in the screening for T cell function in this age group.

REVIEW OF LITERATURE

CHAPTER 1

THE IMMUNE SYSTEM

The immune system is a complex network of cells and organs that functions to protect the body against pathogens. Any invader to the body will be attacked by the components of the innate immune system and, afterwards, by the specific immune system. Innate and specific immunities work conjointly (Protonotariou et al., 2010).

1.1 The innate immune system:

The innate immune system provides a rapid first line of defense, giving the adaptive immune system time to build up a more specific response. Components include phagocytic cells (neutrophils and monocytes in blood, macrophages and dendritic cells in tissues), antigen-presenting cells (APC), natural killer (NK) cells, polymorphonuclear leukocytes (PNL) (Parkin and Cohen, 2001).