# Evaluation of the Efficacy of Narrow Band Ultraviolet B in the Treatment of Chronic Urticaria

Thesis

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# List of Abbreviations

| | |
|---|---|
| **ACE** | Angiotensin converting enzyme |
| **ALT** | Alanine transminase |
| **APST** | Autologous plasma skin test |
| **ASST** | Autologous serum skin test |
| **AST** | Aspartate transminase |
| **BB-UVB** | Broad band – ultraviolet B |
| **CBC** | Complete blood cell count |
| **cc** | Cubic centimetre |
| **CD3+** | Cluster of differentiation 3 |
| **CD4+** | Cluster of differentiation 4 |
| **CD8+** | Cluster of differentiation 8 |
| **CIU** | Chronic idiopathic urticaria |
| **$Cm^2$** | Centimeter square |
| **CNS** | Central nervous system |
| **CU** | Chronic urticaria |
| **Dl** | Deciliter |
| **DNA** | Deoxyribonucleic acid |
| **e.g.** | For example |
| **ELISA** | Enzyme-linked immunosorbent assay |
| **ESR** | Erythrocyte sedimentation rate |
| **FcεRI** | High-affinity Fc receptor for immunoglobulin EI |

## List of Abbreviations (Cont.)

| | |
|---|---|
| **FcεRII** | High-affinity Fc receptor for immunoglobulin EII |
| **h** | Hour |
| **H.pylori** | Helicobacter pylori |
| **HLA-DR** | D related human leucocyte antigen |
| **ICAM-1** | Intercellular adhesion molecule-1 |
| **ID** | Intradermal |
| **IFN-g** | Interferon-g |
| **IgE** | Immunoglobulin E |
| **IgG** | Immunoglobulin G |
| **IL** | Interleukin |
| **IU** | International unit |
| **IVIGs** | Intravenous immunoglobulins |
| **J** | Joule |
| **Kg** | Killogram |
| **LTRAs** | Leukotriene receptor antagonists |
| **MC** | Mast cell |
| **MED** | Minimal erythema dose |
| **mg** | Milligram |
| **ml** | Milliliter |
| **NB-UVB** | Narrow band-ultraviolet B |
| **ng** | Nanogram |
| **nm** | Nanometer |
| **NS** | Non-significant |

## List of Abbreviations (Cont.)

| | |
|---|---|
| **NSAID** | Nonsteroidal anti-inflammatory drugs |
| **OSS** | Outcome scoring scale |
| **PG** | Prostaglandin |
| **PUVA** | Psoralen and ultraviolet A radiation |
| **RNA** | Ribonucleic acid |
| **S** | Significant |
| **SD** | Standard deviation |
| **Th1** | T-helper cells 1 |
| **Th2** | T-herper cells 2 |
| **TNF-a** | Tumor necrosis factor alfa |
| **UAS** | Urticaria activity score |
| **UVA** | Ultraviolet A |
| **UVB** | Ultraviolet B |
| **UVR** | Ultraviolet radiation |
| **VAS** | Visual analogue scale |
| **Vol.** | Volume |
| **ml** | Microliter |

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# Introduction

Chronic urticaria (CU) is a relatively common disorder with an estimated 0.5% lifetime prevalence in the general population. The condition can be severe and debilitating and may impair quality of life ***(Sagi et al., 2011).*** It is defined as presence of urticarial wheals, on most days of the week, for a duration of longer than six weeks ***(Greaves, 2000).***

Depending upon the various aggravating factors and the presence of circulating autoantibodies, chronic urticaria can be further divided into three subgroups: chronic urticaria with potential provoking factors, autoimmune urticaria and chronic idiopathic urticaria ***(Sudha et al., 2006).*** Chronic idiopathic urticaria (CIU) is a common form of chronic urticaria in which no precise causal factors can be identified ***(Champion, 1990).***

The pathogenesis of urticaria represents a special challenge to researchers and it has not yet been fully well understood. The mast cell is the primary agent in the pathogenesis of urticaria, its stimulation results in the release of mediators from cytoplasmic granules, which cause wheal formation, vasodilatation, erythema, accumulation and activation of other cells, including eosinophils, neutrophils, basophils and T lymphocytes (CD4+ more than CD8+). Mast

cell degranulation and histamine release are thought to play a major role in pruritus. It also secretes other mediators, proteases, interleukins, and tumor necrosis factor-alpha ***(Kaplan and Greaves, 2009).***

Urticaria can be attributed to a wide spectrum of clinical causes. However, despite the efforts of researchers, no cause may be found in the majority of cases. The treatment options are: primary prevention in the form of avoidance of aggravating factors, counseling, antihistamines, leukotriene receptor antagonists, prednisolone, sulfasalazine and a host of immunosuppressives ***(Godse, 2009).***

Phototherapy is another line of treatment of chronic urticaria. Systemic PUVA has proven a significant effect in treatment of chronic urticaria in only few studies ***(Olafsson et al., 1986).***

In addition, only two studies assessed the use of narrowband ultraviolet B (NB-UVB) and stated that it is an effective, well-tolerated treatment option in chronic urticaria, but further larger studies with longer follow up periods are necessary to determine the proper clinical response to this therapy ***(Engin et al., 2008; Aydogan et al., 2012).***

# Aim of the Work

The aim of this work is to evaluate the efficacy of narrow band UVB in treatment of chronic urticaria.

# Chronic Urticaria

## 1. Definition

Chronic urticaria (CU) is defined as the recurrent occurrence of short lived cutaneous wheals with or without angioedema, on most days of the week, for a duration of longer than six weeks ***(Greaves, 2000).***

## 2. Epidemiology

### 2.1. Incidence

The exact incidence and prevalence of chronic urticaria are not known, although it occurs in at least 0.1% up to 3% of the population and represents 1-2% of dermatologic patients ***(DeMarco, 2008).*** Approximately 15% to 20% of the general population may have urticaria at least once during their lifetime and there is an approximately 0.5% life time prevalence of chronic idiopathic urticaria in the general population **(*Greaves*, *2003).***

### 2.2. Age

Chronic urticaria is reported to be more common in adults and more in middle aged females ***(Caliskaner et al., 2004).*** Although persons of any age may experience chronic

idiopathic urticaria (CIU), it occurs most frequently after adolescence, with the highest incidence in young adults in the adult population ***(McGirt et al., 2006).***

## 2.3. Race and sex

Urticaria affects persons of all races. Both sexes are affected, however, urticaria is more common in females. CIU occurs twice as often in females as in males ***(O'Donell et al., 1997).***

## 2.4. Morbidity and mortality

Urticaria is not a life-threatening disease; however, chronic urticaria has been shown to have a negative impact on the quality of life of affected patients. The effects of chronic urticaria on the activities of daily living, social interactions, rest and work were found to be similar to those experienced by patients with heart diseases. Mortality rate is rare, unless the condition is accompanied by severe anaphylaxis or severe upper respiratory tract angioedema ***(O'Donell et al., 1997).***

# 3. Types

There are various types of chronic urticaria including: idiopathic urticaria (50%), autoimmune urticaria (30- 40%),

physical urticaria, dermatographism, cholinergic urticaria, cold urticaria, delayed pressure urticaria, solar urticaria, urticarial vasculitis, mastocytosis and papular urticaria ***(Motala, 2005).***

## 4. Clinical Picture

The cardinal clinical features of urticaria that distinguish it from any other type of inflammatory eruption are the repeated occurrence of short-lived cutaneous wheals accompanied by redness and itching ***(Kaplan, 2002).***

Wheals are lesions ranging from a few millimeters to several centimeters in diameter, although if they run together and become confluent much larger plaques may occur. Individual wheals normally, by definition, last less than 24 hours, although there are exceptions. Urticarial wheals are generally paler than the bright red of the surrounding skin because of the compressing effect of dermal edema on the normally blood-engorged post capillary venules ***(Greaves, 2000).***

Typically, urticarial lesions leave no scarring and are generally worsened by scratching. Urticaria may occur anywhere on the skin, including the scalp, palms, and soles. Unlike angioedema, urticaria of the mucous membranes is rare. However, the most commonly affected regions are the perioral