ROLE OF PHOTOTHERAPY IN ALLERGIC RHINITIS

A SYSTEMATIC REVIEW FOR PARTIAL FULFILLMENT OF MASTER DEGREE IN OTOLARYNGOLOGY

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SUMMARY:

AR is an allergen-induced inflammatory disease of the nasal mucosa. It is the most common IgE- mediate inflammatory disease. It is classified into seasonal and perennial AR. its onset is greatest in adolescence.

AR may be influenced by genetic susceptibility, environmental factors and/or exposure to allergens. The allergic response is mediated primarily by type-1 hypersensitivity reaction. The most characteristic symptoms are nasal itching, sneezing, running nose and nasal blockage.

Antihistamines and intranasal corticosteroids are the 1st line of treatment.

UV phototherapy has a profound immunosuppressive effect so it is used in treatment of atopic dermatitis and AR.

Our present study is a systematic review to evaluate the effect of intranasal UV phototherapy on AR cases. The search was done on the MEDLINE database, then screening and evaluation of the articles was done.

The most commonly used UV phototherapy is mUV/VIS. The 3 included studies did not give satisfactory results. So we concluded that UV phototherapy is not a reliable method for treatment of AR.

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Abbreviation	Meaning	Abbreviation	Meaning
AR	Allergic rhinitis	URTIs	Upper respiratory tract infections
IgE	Immunoglobulin E	HPA axis	Hypothalamo-pituitary-adrenal axis
T cell	T lymphocyte	NAC	No adequate control
B cell	B lymphocyte	UV light	Ultraviolet light
TH cell	T helper cell	UVAB	Ultraviolet A and ultraviolet B light
Tr	T regulatory cell	l-VIS	Visible light
L C	Langerhans cell	mUV/vis	Mixed UVA-UVB-vis light
SPT	Skin prick test	PUVA	Psoralen plus UVA
SET	Serial endpoint titration	TNF	Tumor necrosis factor
nm	Nanno-meter	INF	Interferon
8-MOP	8- methoxypsoralen	Xe CL	Xenon chloride
RQLQ	Rhinoconjunctivitis Quality of Life Questionnaire	TNS	Total nasal score
DNA	Diriponucleac acid		

INTRODUCTION

Allergic Rhinitis

Definition:

Allergic rhinitis is an allergen-induced, IgE-mediated inflammatory disease of the nasal mucosa, triggered by exposure to allergen. **(koreck et al 2005)**

Classification:

It is classified into:

SEASONAL ALLERGIC RHINITIS: The symptoms of seasonal allergic rhinitis increased during certain seasons, usually depending on the pollination of plants to which the patient is allergic. Characteristic symptoms of seasonal allergies include sneezing, watery rhinorrhea, itching of the nose, eyes, ears, and throat, red and watering eyes, and nasal congestion, which are usually worse in the morning and are aggravated by dry, windy conditions **(Csoma et al 2006).**

PERENNIAL ALLERGIC RHINITIS: The symptoms of perennial allergic rhinitis are usually constant, with little seasonal variation, although they may vary in intensity. Characteristic symptoms are predominantly nasal congestion and blockage, and postnasal drip. Rhinorrhea and sneezing are less common. Eye symptoms are less common, except with animal allergies. Seasonal pollen

may cause the exacerbation of any of these symptoms **(Simons 2003).**Common allergens that cause perennial allergic rhinitis are indoor inhalants, predominantly dust mites, animal dander, mold spores, and cockroaches (in inner cities). Certain occupational allergens and Food allergens may also contribute to perennial allergic rhinitis **(Mitchell et al 2008).** In children with allergies, there may be a higher incidence of respiratory tract infections, which in turn tend to aggravate allergic rhinitis and may lead to the development of complications, especially rhinosinusitis and otitis media with effusion **(Doyle 2002).**

OTHER CLASSIFICATIONS: One of these is related to both the temporal incidence and the quality of life. Symptoms are classified

(1) as being intermittent (< 4 d/wk or < 4 weeks' duration) or persistent (> 4 d/wk or > 4 weeks' duration) and

(2) by the intensity of the symptoms, with either minimal or moderate to severe changes in the quality of life **(Resnick et al 2008).**

Epidemiology:

Allergic rhinitis is the most common of all the IgE-mediated allergic diseases **(Neuman and Finkelstein 1997).**It is a high-cost and high-prevalence disease with a major effect on the quality of life. It is also considered to be a risk factor for asthma.Allergic rhinitis is one of the most frequent allergic diseases, affecting about 15-30% of the population. Its prevalence is still increasing particularly in the well-developed, industrialized countries **(Csoma et al 2006).**A tentative estimate of the prevalence of allergic rhinitis (AR) suggests a figure of 500 million sufferers worldwide. It affects the quality of life and the patient's efficiency and leads to productivity losses **(Brehmer 2010).**Allergic rhinitis may have its onset at any age, but the incidence of onset is greatest in adolescence, with a decreasing incidence with advancing age. Its peak prevalence is during the third and fourth decades **(Neuman and Finkelstein 1997).**

Aetiology:

Allergic rhinitis may be influenced by the following:

- genetic susceptibility (eg, family history);

- environmental factors (eg, dust and mold exposure);
- exposure to allergens (eg, pollens, animal dander, and foods);
- passive exposure to tobacco smoke (especially in early childhood); and
- Diesel exhaust particles (in urban areas) among other factors. **(Togias 2003)**

Pathophysiology:

The allergic response is atopic reaction which is mediated primarily by a type I hypersensitivity reaction with excess production of IgE antibodies **(Simons 2003).** In patients with an atopic disposition (a genetic trait), an allergic reaction begins with sensitization to a specific allergen which induces IgE-antibody production. This occurs through a T-cell, B-cell, and plasma cell cascade **(Wilson et al 2001).** On subsequent exposure, the specific antigen attaches to two specific IgE antibodies attached to the surface of mast cells in the submucosa of the respiratory tracts. Consequently, this IgE-mediated reaction causes degranulation of the mast cell, which then provokes an inflammatory response with the release of mediators such as histamine, leukotrienes, cytokines, prostaglandins, and platelet-activating factor. This is referred to as the **early-**

phase or **humeral reaction**; the release of histamine causes the symptoms of sneezing, rhinorrhea, itching, vascular permeability, vasodilatation, and glandular secretion **(Fiset et al 2003).**The release of cytokines and leukotrienes subsequently causes an influx of inflammatory cells (mainly eosinophils) into the affected area (chemotaxis). This inflammatory response is called the **late-phase** or **cellular reaction,** that may prolong and enhance the allergic cascade for as long as 48 hours**.** This response is the main cause of the symptoms of nasal congestion and postnasal drip in allergic rhinitis. In addition, these mediators produce a hyperreaction to both specific allergens and nonspecific irritants, referred to as the **priming effect (Bradding et al 1995**).

Allergic rhinitis diagnosed by clinical Findings:

A family history of allergies and thorough allergy history.The most characteristic symptoms are nasal itching, sneezing, nose running, nose blocking, itching of the palate, itching of the eyes and of external auditory canal, oedema of the eyelids and occasionally impairment of the sense of smell**.** Associated ocular, pharyngeal, and systemic symptoms also are found **(Csoma et al 2006).**By inspection of the ears, throat, and nasal passages (including after

decongesting with a topical decongestant). Typical findings in the nose in patients with seasonal allergic rhinitis include bluish, pale, boggy turbinates; wet, swollen mucosa; and nasal congestion with nasal obstruction. With perennial allergies, nasal congestion is the predominant sign, but the nasal examination may appear normal **(Gray et al 2004).** Anatomic abnormalities, such as a deviated nasal septum, concha bullosa, and nasal polyps, may be present. If nasal polyps are suspected, an endoscopic nasal exam is warranted. In children, allergic "shiners" (dark circles under the eyes), facial grimacing, mouth breathing, and the "nasal salute" (constant rubbing of the tip of the nose with the hand) are common physical findings. In addition, in this age group, a concomitant otitis media with effusion is also a possibility **(Passalacqua et al 2006).**

Special Tests

1. Allergy testing

It can determine the causative allergens responsible. Two major types for identifying and quantifying allergen sensitivity: skin testing and in vitro serum assays.

2. Skin testing

Skin testing can be epicutaneous, intradermal, or a combination of both.