



شبكة المعلومات الجامعية
التوثيق الإلكتروني والميكرو فيلم

بسم الله الرحمن الرحيم



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جامعة عين شمس

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قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
علي هذه الأقراص المدمجة قد أعدت دون أية تغيرات



يجب أن

تحفظ هذه الأقراص المدمجة بعيدا عن الغبار



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INTRODUCTION AND AIM OF THE WORK

Immune system means the body's natural defense system against foreign materials which penetrate the skin or mucous membranes. Accordingly the immune system enables the body to counter attack certain diseases precursors. The immune system's responses to the hormonal and metabolic changes, which accompany stress, suppress its disease-fighting activity. If malnutrition accompanies stress, the immune system is forced to work without adequate nutrient support, which impairs its activity (*Whitney et al., 1991*).

The Immune system is composed of a complex and highly interactive network of cells and their products. The system exhibits two unique characteristics: exquisite specificity and "memory". That is, a subset of the immune cells recognizes and responds to each of the Myriad of external stimulation a person might encounter a lifetime (specificity). The immune system is capable of mounting a much more vigorous and effective response then a particular stimulus is received (memory). The immune system regulates itself by means of the so-called helper suppressor cells and soluble products. The Immune system is also in close communication with other systems in the

body (e.g., the neuroendocrine system) and is regulated by those systems as well (**Reichlin, 1993**).

Wheatgrass juice is having efficient healing properties. As it contains all minerals and vitamins like A, C, E, K and B complex too. It has many proteins and also contains 17 amino acids. The chlorophyll in the wheatgrass has enzymes, interestingly the super oxide dismutase in wheatgrass helps to slow down the ageing process. The chlorophyll also prevents the growth of bacteria. The wheatgrass is found to be having more than 100 elements needed for a healthy individual (**Dey et al., 2006**).

Grunewald, (2009) stated that Wheatgrass is also known as green blood because it enhances the production of red blood cells

Shirude, (2011) mentioned that throughout human history, plants have played a key role in treating human diseases. In thousands of years of trials, human found many plants which are good for treating ailments and curing serious health problems like cancer, diabetes, and atherosclerosis. They are a kind of alternative medicine that is inexpensive, and has no side effects. For example: wheatgrass, *Aloe vera*, curcumin, alfalfa, garlic, ginger, German chamomile, grapefruit, green tea. In 2002, the U.S. National Center for complementary and Alternative Medicine of National Institutes of Health began funding

clinical trials about the effectiveness of herbal medicines. In 2010, a survey of 1000 plants was completed, out of which 356 had clinical trials published evaluating their - pharmacological activities and therapeutic applications. One of these plants, Wheatgrass, has been an integral part of Indian culture for thousands of years, and has been known to have remarkable healing properties

Herbal or "alternative" medicine is gaining popularity and scientific attributes regarding wheatgrass as a “functional food” is becoming more available and popular as a research topic. Wheat grass is the mature shoot of (*Triticum aestivum*) Linn. belonging to the family Gramineae. *Triticum* is a genus of annual and biennial grasses, yielding various types of wheat, native to south west Asia ([http:// informa health care. com](http://informahealthcare.com)).

Rana et al., (2011) mentioned that Wheatgrass is very nutritious and 2021it is widely used as a food supplement as it prevents human body from various health issues as well as improves immunity.

Wheatgrass juice is especially high in chlorophyll along with some other constituents. Wheatgrass washes down and manufactures the blood because of its high substance of chlorophyll. Chlorophyll is the main result of light and in this manner contains more mending properties than some other component. From the sun, several lives are

originated. Only, green plants by the process of photosynthesis will utilize the vitality of sun. Chlorophyll is known as the 'life-blood' of the plants. Drinking wheatgrass juice resembles drinking fluid daylight. Chlorophyll conveys elevated amounts of oxygen (in addition to other things) which is particularly intense in helping the body to reestablish irregularities. The chlorophyll which has more oxygen conveys more oxygen to the blood. Red blood cells numbers will increase and blood oxygen levels raises rapidly with the drinking of wheatgrass squeezed juice and utilizing wheatgrass juice. This is a key indicator of recovery for various abnormalities, ailments and diseases. The Oxygen acts as a crucial element to numerous body parts, especially cerebrum utilizes 25% of the oxygen supply. This high oxygen in body results a sound body (*Rana et al., 2011*).

Mogra and Rathi, (2013) reported that Wheatgrass is extract of the cotyledons of the common wheat plant (*Triticum aestivum*) belonging to family Graminea.

Wheatgrass is grown from common wheat (*Triticum aestivum*), a subspecies of the family Phocaea. It is widely grown throughout temperate regions of North America and Europe. Indigenously, wheatgrass has been used as an herbal medicine since ages. In 1930's Charles F Schnabel brought wheatgrass for experimental trails. Ever since it has

been manufactured and marketed by various consumer-based product companies. Being a non-toxic herb it also evades Food and Drug Administration screening (***Dasg et al., 2015***).

Wheatgrass is one of the World strongest immune system boosters because it contains vitamins A, B, C, E, I, K, and every mineral known to mankind. Wheatgrass is also a very strong protein source containing more than 15 amino acids. It has countless health benefits like reducing high blood pressure, cleanses body toxic Wheatgrass juice is also called as Green Juice. Wheatgrass means the green leaf of 'baby' red berry wheat plant. In tropical climate Wheatgrass grows to a height of around 6 inches in just 7 days. Cutting the green leaf wheat grass at this „jointing stage" (before the stem begins to form) and drinking its green chlorophyll rich Wheatgrass juice is known to have many therapeutic benefits. Wheatgrass juice is nature's finest pharmaceutical. It is a capable concentrated fluid supplement. Two ounces of wheatgrass juice has nutritional equivalent called five pounds of the best crude natural vegetables. For instance, wheatgrass has double the measure of vitamin A as carrots and is higher in vitamin C than oranges. It contains the all B complex vitamins, and also calcium, phosphorus, magnesium, sodium and

potassium in an adjusted proportion (***Akram and Aftab, 2015***).

Wheatgrass is a finished wellspring of protein, supplying the majority of the key amino acids, and more. It has around 20% of aggregate calories originating from protein. This protein is as poly peptides, simpler and shorter chains of amino acids that the body utilizes all the more productively as a part of the circulation system and tissues (***Ghani et al., 2015***).

Wheatgrass is having fundamental vitamins and supplements that keep mind and body solid and energetic. Taking a "shot" of squeezed wheatgrass in morning breakfast every day is considered as a solid approach to begin the day; however it can get exceptionally costly. So, to make wheatgrass a standard piece of your eating routine, developing it yourself at is best way (***Bharali et al., 2015***).

Immunity is defined as the body's ability to recognize and eliminate foreign materials, Hence the Wheatgrass supplies the body with helpful measurements of vitamins, minerals, cancer prevention agents, chemicals, and phytonutrients, wheatgrass is likewise a capable detoxifier, particularly of the liver and blood. It kills poisons and ecological contaminations in the body. This is on account of Wheatgrass contains useful compounds that shield us from cancer-causing agents, including Superoxide

Dismutase (SOD), that decreases the impacts of radiation and overview poisons in the body. It scrubs the body from head to toe of any overwhelming metals, poisons and different poisons that might be put away in the body's tissues and organs. It is good to have two ounces of wheatgrass juice every day (*Sofi et al., 2016*).

This study aimed to:

- 1- Study the effect of wheatgrass nutrition on the efficiency of the immune system.
- 2- Raise the efficiency of the immune system or revitalize it by using wheatgrass.

REVIEW OF LITERATURE

Immune system and its functions:-

The immune system of the human divided into two parts. The innate immune response includes defense mechanisms that are encoded in the host's genes. These are typically physical barriers (e.g., the epithelial cell layers or mucus), soluble proteins, small molecules released from cells (e.g., cytokines or chemokine's) or present in body fluids (e.g., complement proteins), and membrane bound receptors and cytoplasmic proteins. The organs involved in this system are mostly secondary lymphoid organs, such as the spleen, tonsils, lymph nodes (LNs) and the cutaneous and mucosal organs these are the organs where B- and T-lymphocytes recognize foreign antigens, initiate an elective immune response and help facilitate the crucial interactions between B- and T-cells. They contain zones with clusters of B- and T-cells (*Fu and Chaplin, 1999*).

All of the cells of the immune system are derived from stem cells in the bone marrow. These cells give raise two classes of progenitor cells: (1) lymphoid progenitors are precursors to antigen specific T and B lymphocytes, and (2) *myeloid progenitors* are the precursors for the nonspecific macrophages, monocytes, dendritic cells, mast cells, and granulocytes (neutrophils, eosinophils, basophils). *B-cells* remain in the bone marrow during

development, selection, and maturation, whereas *T-cells* migrate to the thymus to mature. Once mature, T and B-cells emerge from these *primary immune organs* to reside in *secondary immune organs*, e.g., lymph nodes, spleen, tonsils and lymphoid mucosa (***Janeway et al., 2001***).

The functions of the immune system can be divided into two systems: (1) innate or nonspecific immunity, and (2) *specific* or adaptive immunity. These interacting systems differ in terms of the timing and specificity of their responses. Innate immunity provides an immediate but relatively nonspecific response to contain pathogens at the site of entry into the body. Innate immune defenses include inflammatory and acute phase responses, as well as the anatomical and chemical barriers provided by the skin and mucous membranes. Specific immunity is characterized by antigen-specificity through T and B lymphocytes. It also exhibits immunological memory, where heightened responses occur upon subsequent exposure to the same antigen, but this is not an immediate response. Although specific immunity is more selective and adaptive than innate immunity, it is a slow and complex process that occurs over several days to weeks. Conversely, innate immunity provides an immediate front line response.

But it lacks memory and can damage healthy tissue due to its nonspecific nature (***Parkin and Cohen, 2001***).

The lymphatic vessel system is also specialized to electively help the immune response. Specialized vessel structures, such as the endothelial venules in LNs and the marginal sinus in the spleen, anciently lure naive B- and T-cells through afferent lymphatic vessels into a connected Lymphoid organ containing the antigen information of the invading microbes by using chemokines or other specific signals (e.g., lysophospholipid sphingosine 1-phosphate). The efferent lymphatic vessels provide a fast way into the bloodstream for activated antigen presenting cells (APCs) (*Allen et al., 2007*).

However, other subsets of leukocytes and immune cells are also needed for a complete immune response. Pluripotent hematopoietic stem cells can differentiate and mature into B-cells, T-cells and natural killer (NK) cells. NK cells can identify virus-infected cells or tumor cells using their complex cell surface receptors (*Jonsson and Yokoyama, 2009*).

Within these zones, dendritic cells (DCs) bind antigen–antibody complexes for antigen B-cell maturation and activation, as well as binding to antigen presenting cells

For T-cell activation. The adaptive immune system is programmed to be highly specific, based on unique antigen

receptors located on the membranes of B- and T-lymphocytes. There are millions of lymphocytes, which cover a vast array of antigen receptors, all with unique specificities for certain, antigens. The B- and T-lymphocytes mature in the BM and thymus, respectively, which is the body's primary lymphoid organs (*Chaplin, 2010*).

In parallel, another autoimmune disease widely studied that involves cytokines, besides several other factors, is the type 1 diabetes mellitus. This disease is characterized by pancreatic β cells destruction, which it is due to hypersensitivity reactions mediated by CD4⁺ TH 1 cells. Reactive with islet antigens, the effect of cytotoxic T lymphocyte on lysis of islet cells, and local production of cytokines, especially TNF, IL-1, IL-21 and IFN- α . In some cases, the islets show cellular necrosis and lymphocytic infiltration, consisted of both CD4⁺ and CD8⁺ cells.

Remaining islet cells often express class II MHC molecules, an effect of local production of INF- γ by the T cells (*Khan, 2017*).

Malnutrition and immunity: -

Beisel, (1996) mentioned that malnutrition have adverse, even devastating effects on the antigen-specific arms of the immune system and generalized host defensive

mechanism; where dysfunctions of cell-mediated immunity occur. Humoral immunity continues to be maintained, although new primary response to T-cell dependent antigens is generally subnormal in both magnitude and quality. Immune logical dysfunctions associated with malnutrition have been termed, “Nutritionally Acquired Immune Deficiency syndrome” (NAIDS). Infants and small children are at great risk because they possess only immature, inexperienced immune systems and very small protein reserves. The combination of NAIDS and common childhood infections is the leading cause of human mortality. NAIDS can generally be corrected by appropriate nutritional rehabilitation. Acquired immune deficiency syndrome (AIDS) and NAIDS are intensely synergistic. AIDS-induced malnutrition can lead to the secondary development of NAIDS with its much boarder array of additional immunological dysfunctions. The complex and far reaching insults the immune system caused by NAIDS, and the synergistic combination of NAIDS and AIDS, thereby hasten the demise of many victims of AIDS. Aggressive nutritional support for children with human immune deficiency virus (HIV) infections could play, or lessen the development of NAIDS and avoidance of NAIDS would improve both quality and length of life.