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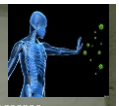
Immune System



The immune system is a system of many biological structures and processes within an organism that protects against disease. To function properly, an immune system must detect a wide variety of agents, known as pathogens, from viruses to parasitic worms, and distinguish them from the organism's own healthy tissue. In many species, the immune system can be classified into subsystems, such as the innate immune system versus the adaptive immune system, or humoral immunity versus cell-mediated immunity.

The term "autoimmune disease" refers to a varied group of illnesses that involve almost every human organ system. It includes diseases of the nervous, gastrointestinal, and endocrine systems, as well as skin and other connective tissues, eyes, blood and blood vessels.

In all of these disorders, the underlying problem is "autoimmunity" – the body's immune system becomes misdirected and attacks the very organs it was designed to protect.

American Autoimmune Related Diseases Association, Inc.

AUTOIMMUNE

- AARDA states autoimmune diseases effects up to 50 million Americans
- There are as many as 80 types of autoimmune diseases. Many of them have similar symptoms, which makes them very difficult to diagnose. It is also possible to have more than one at the same time. They usually fluctuate between periods of remission (little/no symptoms) and flare-ups (worsening symptoms).
- There are no cures for autoimmune diseases, so treatment focuses on relieving the symptoms

Autoimmune Disease Pathophysiology

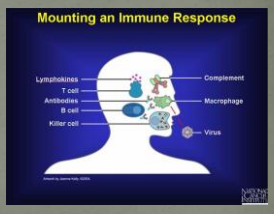
- Autoimmune diseases often run in families, and 75 percent of those affected are women (AARDA). African Americans, Hispanics, and Native Americans also have an increased risk of developing an autoimmune disease.
- There is a genetic predilection association with many.

Inflammatory Conditions

- Inflammatory abnormalities are a large group of disorders that underlie a vast variety of human diseases. The immune system is often involved with inflammatory disorders, demonstrated in both allergic reactions and some myopathies, with many immune system disorders resulting in abnormal inflammation. Non-immune diseases with etiological origins in inflammatory processes include cancer, atherosclerosis, and ischemic heart disease.
- A large variety of proteins are involved in inflammation, and any one of them is open to a genetic mutation which impairs or otherwise dysregulates the normal function and expression of that protein.

Autoimmunity Versus Inflammatory

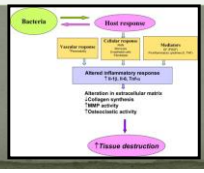
- The immune response differs from the inflammatory response in that it has the capacity to remember past instances of injury and responds more quickly to a foreign substance that is encountered.
- The innate immune response does not involve a memory.
- The acquired immune response involves a complex network of white blood cells.
- As with inflammation, the immune response may also result in an increased level of injury and disease.



Inflammation in Periodontal disease

- Establishment of bacterial plaque biofilm
- Production of toxins by bacteria (e.g., lipopolysaccharide [LPS]
- Immunity modulates affect of biofilm and by-products
- Inflammation, cell death, and necrosis occur; alteration of fibroblasts occurs within the gingival connective tissue
- Host immune response continues- intrinsic immunity is supplemented by adaptive immunity. B cells produce plasma cells ultimately producing antibodies; antigen-antibody reactions lead to the production of complement
- Immune cells produce prostaglandins and cytokines
- Neutrophils, macrophages, and other inflammatory cells release collagenase and other enzymes that lyse cells.

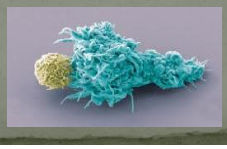
Inflammatory Biochemical Mediator	Local Effects
Cytokine IL-1	Stimulates osteoclast activity, resulting in bone resorbtion. Induces collagen breakdown
Cytokine IL-6	Stimulates bone resorption. Inhibits bone formation
Cytokine IL-8	Stimulates connective tissue destruction. Stimulates bone resorption
Cytokine TNF-α	Stimulates bone resorption. Induces breakdown of collagen matrix
Prostaglandin E_2	Stimulates MMP secretion. Stimulates bone resorption.
MMP Enzymes	Induce breakdown of collagen matrix in the gingiva, periodontal ligament and alveolar bone.



Components of the Immune System

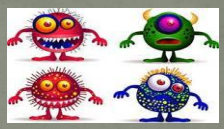
Components of the immune system that play an important role in combating periodontal disease

- **Cellular defenders** (phagocytes, lymphocytes)
- **The complement system**



Functions of Complement System

- Destruction of pathogens
- Opsonization of pathogens
- Recruitment of phagocytes
- Immune clearance



- Uncontrolled complement activation can lead to the loss of antimicrobial immune protection, but can also initiate, feed, and perpetuate inflammatory conditions leading to tissue destruction and may play a role in the activation of an autoimmune disorder

Inflammatory Biochemical Mediators

Biochemical Mediators	Function
Cytokine	1. Recruit cells such as PMNs and macrophages to the infection site. 2. Increase vascular permeability allowing immune cells and complement to move into the tissues at the infection site 3. Have the potential to initiate tissue destruction and bone loss
Prostaglandins	1. Increase the permeability and dilation of the blood vessels, leading to redness and edema of the connective tissue. 2. Trigger osteoclasts-bone consuming cells- to destroy the alveolar bone. 3. Promote the overproducion of destructive MMP enzymes 4. Prostaglandins initiate most of the alveolar bone destruction in periodontitis
MMPs Matrix Metalloproteinases	1. MMP's effects in health: under normal conditions MMPs facilitate the normal turnover of the periodontal connective tissue matrix. 2. MMPS effects in chronic inflammation: An overproduction of MMPS results in the breakdown of the connective tissue of the periodontium. In the presence of increased MMP levels, extensive collagen destruction occurs.

Immune System Component	Function
PMN	Phagocytosis Release of lysosomes Release of cytokines
Macrophage	Phagocytosis Release of lysosomes Release of cytokines
B lymphocyte/Plasma Cells	Production of immunoglobulin
T lymphocytes	Further stimulate the immune response
Immunoglobulins IgG, IgM, IgA, IgD, IgE	Neutralize bacteria or toxins Coat bacteria to facilitate phagocytosis Activate complement system
Complement System	Phagocytosis Lysis of cell membranes Recruitment of additional phagocytic cells

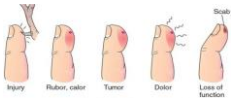
Autoimmune Conditions

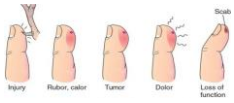
Note: This is a partial list

Female : Male Ratio Common Autoimmune Disorders	
Hashimoto's thyroiditis	10 : 1
Systemic lupus erythematosus	9 : 1
Sjögren's syndrome	9 : 1
Antiphospholipid syndrome-secondary	9 : 1
Primary biliary cirrhosis	9 : 1
Autoimmune hepatitis	8 : 1
Graves' disease	7 : 1
Scleroderma	3 : 1
Rheumatoid arthritis	5 : 1
Antiphospholipid syndrome-primary	2 : 1
Autoimmune thrombocytopenic purpura (ITP)	2 : 1
Multiple sclerosis	2 : 1
Myasthenia Gravis	2 : 1
Fibromyalgia	9 : 1

Types of Autoimmune Conditions

- Getting a diagnosis can be frustrating and stressful to the patient.
- Frequently the first symptoms are: fatigue, muscle aches and a low fever. The classic sign of an autoimmune disease is inflammation, which can cause redness, heat, pain and swelling.
- The diseases may also have flare-ups, when they get worse, and remissions, when symptoms get better or disappear. Treatment depends on the disease, but in most cases one important goal is to reduce inflammation. Sometimes doctors prescribe **steroids** or other drugs that reduce your immune response.





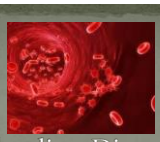
Lethargy? Stress? No OOMPH????

Autoimmune Classification

- For a disease to be regarded as an autoimmune disease it needs to answer to Witebsky's postulates.
  - Witebsky helped develop procedures for the isolation and partial characterization of A and B blood antigens. He also began the practice of neutralization of certain antibodies in the blood of universal blood donors.In 1957 he co-authored a paper that first formulated "Witebsky's postulates" that determine whether a disease entity can be regarded as an autoimmune disease. They were modified in 1993
- Direct evidence from transfer of disease-causing antibody or disease-causing T lymphocyte white blood cells
- Indirect evidence based on reproduction of the autoimmune disease in experimental animals
- Circumstantial evidence from clinical clues
- Genetic evidence suggesting "clustering" with other autoimmune diseases

Autoimmune Conditions

- Occurs when your immune system mistakenly attacks your own body's tissues. In addition to causing joint problems, rheumatoid arthritis sometimes can affect other organs of the body — such as the skin, eyes, lungs and blood vessels.
- These patients have a debilitating condition which effects their entire body but especially the oral cavity.
- Frequently, they build up a lot of plaque and due to their inability to thoroughly cleanse the oral cavity or the lack of energy to do this often during the day and night, they let their home care go. It is an effort



Bleeding Disorders

Platelet & Clotting Disorders
Neutropenia
Leukemia

Complete Blood Count Normal Adult Values: Red Blood Cells

The complete blood count (CBC) is important in the diagnosis of blood disorders. The CBC is a series of tests that examines the red blood cells, white blood cells, and platelets. Normal values are found below:

	Male	Female
Red Blood Cells: The total number of red blood cells (RBCs) mm^3 of whole blood	4.6 - 6.2 × 10^6	4.2 – 5.4 × 10^6
Hemoglobin: The amount of hemoglobin contained in 10 ml of whole blood	13.5 – 18 g	12 – 16 g
Hematocrit: The volume of packed RBCs in 100 ml if whole blood	40% - 54%	38% - 47%
Indices: Mean corpuscular (cell) volume: describes the average sized of an individual RBC		27 – 31 pg
Mean corpuscular (cell) hemoglobin concentration: indicates the proportion of each cell occupied by hemoglobin		23% - 36%

Complete Blood Count Normal Adult Values: White Blood Cells

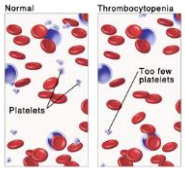
Differential Count: The number of each type of white blood cell (WBC) expressed as a percentage of the total number of WBCs

Mature neutrophils (granulocytes)	50% - 60%
Immature neutrophils (bands)	2% – 4%
Lymphocytes	30% - 40%
Monocytes	1% - 9%
Basophils	0% - 1%
Eosonophils	2% - 3%

Platelet Count

According to the Mayo Clinic:

- 150,000 – 450,000 Normal Count
- Platelets are continually being made by our bodies. They live only about 10 days
- They are produced in the bone marrow

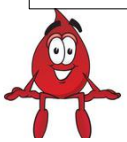


Thrombocytopenia: Platelet Disorders

Classification, Etiology and Management

Thrombocytopenia Types

Decreased Production of Platelets	Increased Production of Platelets
•Dehydration, Vitamin B12 or folic acid deficiency **•Leukemia Idiopathic thrombocytopenic purpura** •Thrombotic thrombocytopenic purpura •Decreased production of thrombopoietin by the liver in liver failure •Sepsis, systemic viral or bacterial infection •Dengue fever •Hereditary syndromes •Myelodysplastic syndrome or aplastic anemia •Congenital amegakaryocytic thrombocytopenia •Thrombocytopenia absent radius syndrome •Fanconi anemia •Bernard-Soulier syndrome, (associated with large platelets) •May-Hegglin anomaly, •Grey platelet syndrome •Alport syndrome •Wiskott–Aldrich syndrome	• Hemolytic-uremic syndrome •Disseminated intravascular coagulation •Paroxysmal nocturnal hemoglobinuria •Antiphospholipid syndrome •Systemic lupus erythematosus •Post-transfusion purpura •Neonatal alloimmune thrombocytopenia •Hypersplenism •Gaucher's disease



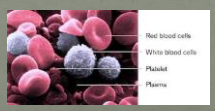
Thrombocytopenia

- Thrombocytopenia and thrombopenia refer to a disorder in which there is a relative decrease of thrombocytes, commonly known as platelets, present in the blood.
- A normal human platelet count ranges from 150,000 to 450,000 platelets per microliter of blood. These limits are determined by the 2.5th lower and upper percentile, so values outside this range do not necessarily indicate disease. One common definition of thrombocytopenia that requires emergency treatment is a platelet count below 50,000 per microliter.

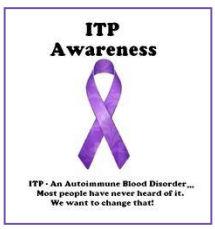
- Ideally physicians would like the platelet count to be: 125,000 = 250,000

IDIOPATHIC THROMBOCYTOPENIA PURPURA

ITP: (idiopathic Thrombocytopenia Purpura)	What is occurring in ITP is that the IgG or IgA auto-antibodies in the patient's blood bind to antigens on the membranes of circulating platelets, resulting in the destruction of those platelets



IDIOPATHIC THROMBOCYTOPENIA PURPURA



IDIOPATHIC THROMBOCYTOPENIA PURPURA

- **ITP is a bleeding condition** in which the immune system destroys platelets, which are necessary for normal blood clotting. Persons with the disease have too few platelets in the blood.
- There are cells that act against platelets produced by the body
- Some of the **major** possible complications could be :
  - Sudden and severe loss of blood from the digestive tract
  - Bleeding into the brain

ITP

- Idiopathic thrombocytopenic purpura (**ITP**) may have no symptoms
- Twice as likely to develop in women as men
- In children ITP may develop after a virus but it usually will go away on its own
- Commonly seen in older people

International Journal of Dental Hygiene
CASE REPORT

E. Guneldemir

The role of oral hygiene in a patient with idiopathic thrombocytopenic purpura

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Abstract: *Objective* Idiopathic thrombocytopenic purpura (ITP) is an acquired disease of children and adults defined as isolated thrombocytopenia with no clinically apparent associated conditions or other causes of thrombocytopenia. Oral manifestations are gingival bleeding, petechiae, mucocutaneous bleeding and haemorrhage into tissues. *Case description and results:* An 11-year-old Turkish female was referred to the periodontology clinic by the paediatric haematologist for the treatment of spontaneous gingival bleeding, gingival oedematous enlargement and hyperaemia. She was diagnosed as chronic ITP 6 months ago and she was told not to brush her teeth. She was also complaining with dull pain and oral malodor. She was motivated for oral hygiene and after consulting with paediatric haematologist, under the proper circumstances, dental plaque and calculus were removed.

Fig. 2. On 24 February 2006, after she had begun to brush her teeth. Haemorrhage, oedema and gingival bleeding decreased.

Fig. 3. After the scaling and root planning of anterior regions in both jaws, on 24 April 2006.

Chronic Lymphocytic Leukemia

Cancer of the Bone marrow

Chronic Lymphocytic Leukemia

CLL (Chronic Lymphocytic Leukemia)	**A type of cancer of the blood and bone marrow - the spongy tissue inside bones where blood cells are made. Chronic lymphocytic leukemia most commonly affects older adults.**

Chronic Lymphocytic Leukemia

- Chronic lymphocytic leukemia most commonly affects older adults. Chronic lymphocytic leukemia treatments can help control the disease
- Chronic lymphocytic leukemia (CLL) is a type of cancer of the blood and bone marrow
- The term "chronic" comes from the fact that it usuaally progresses more slowly than other types of leukemia. The term "lymphocytic" comes from the cells affected by the disease which are white blood cells called lymphocytes. Lymphocytes help the body fight infection.

Chronic Lymphocytic Leukemia

- There are abnormal and ineffective lymphocytes which continue to live and multiply.
- They accumulate in the blood where complications occur as a result because they crown out the bone marrow's healthy cells and they interfere with normal cell production.
- Normal lymphocytes die.

CHRONIC LYMPHOCYTIC LEUKEMIA & IDIOPATHIC THROMBOCYTOPENIA PURPURA Sources

- http://www.mayoclinic.org/diseases-conditions/chronic-lymphocytic-leukemia/basics/definition/con-20031195

Rheuamtoid Arthritis

Rheumatoid Arthritis	A chronic inflammatory disorder that typically affects the small joints in your hands and feet. Unlike the wear-and-tear damage of osteoarthritis, rheumatoid arthritis affects the lining of your joints, causing a painful swelling that can eventually result in bone erosion and joint deformity. This frequently is accompanied by Sjögren's Syndrome.



Sjögren's Syndrome

- Sjogren's (SHOW-grins) syndrome is a disorder of your immune system identified by its two most common symptoms — dry eyes and a dry mouth.
- Sjogren's syndrome often accompanies other immune system disorders, such as rheumatoid arthritis and lupus. In Sjogren's syndrome, the mucous membranes and moisture-secreting glands of your eyes and mouth are usually affected first — resulting in decreased production of tears and saliva.
- Although you can develop Sjogren's syndrome at any age, most people are older than 40 at the time of diagnosis. The condition is much more common in women. Treatment focuses on relieving symptoms

Scleroderma

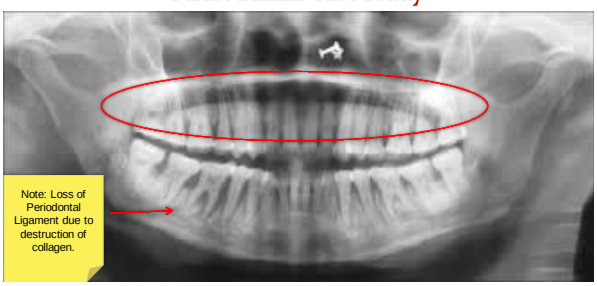
A group of rare diseases that involve the hardening and tightening of the skin and connective tissues — the fibers that provide the framework and support for your body. There is an overproduction and accumulation of collagen in body tissues. The organic matrix contains collagen fibers.
There is a response to cold temperatures or emotional distress, which can cause numbness, pain or color changes in the fingers or toes.
Termed Raynaud's phenomenon, this condition also occurs in people who don't have scleroderma.
There can be acid reflux, which can damage the section of esophagus nearest the stomach,. There can be severe headaches.
Scleroderma affects women more often than men and most commonly occurs between the ages of 30 and 50.

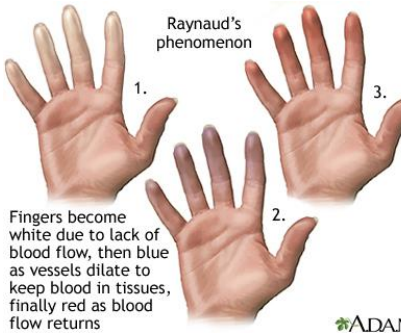
SCLERODERMA

- Sclero: Hard
- Derma
- Skin
- It is NOT contagious, infectious, cancerous or malignant

Sceleroderma	
Skin	Skin. Nearly everyone who has scleroderma experiences a hardening and tightening of patches of skin. These patches may be shaped like ovals or straight lines. The number, location and size of the patches vary by type of scleroderma. Skin can appear shiny because it's so tight, and movement of the affected area may be restricted.
Extremities (Fingers & Toes)	One of the earliest signs of scleroderma is an exaggerated response to cold temperatures or emotional distress, which can cause numbness, pain or color changes in the fingers or toes. Called Raynaud's phenomenon, this condition also occurs in people who don't have scleroderma.
Digestive system.	In addition to **acid reflux**, which can damage the section of esophagus nearest the stomach, some people with may also have problems absorbing nutrients if their intestinal muscles aren't moving food properly through the intestines.
Heart, lungs or kidneys	Rarely, scleroderma can affect the function of the heart, lungs or kidneys. These problems can become life-threatening.

Scleroderma Case Study





RHEUMATOID ARTHRITIS

- The Arthritis Foundation is the Champion of Yes. Leading the fight for the arthritis community, the Arthritis Foundation helps conquer everyday battles through life-changing information and resources, access to optimal care, advancements in science and community connections. Our goal is to chart a winning course, guiding families in developing personalized plans for living a full life – and making each day another stride towards a cure. We also publish *Arthritis Today,* the award-winning magazine that reaches 4.2 million readers.
- http://www.arthritis.org/about-us/mission-vision.php

RHEUMATOID ARTHRITIS

- A chronic inflammatory disorder that typically affects the small joints in your hands and feet.
- The body's immune system mistakenly attacks its own body's tissues
- Can effect the skin, eyes, lungs and blood vessels.
- Usually is seen in women over 40

SIGNS AND SYMPTOMS

- Tender, warm, swollen joints
- Morning stiffness that may last for hours
- Firm bumps of tissue under the skin on one's arms
  - (rheumatoid nodules)
- Fatigue
- Fever
- Weight loss

ORAL MANIFESTATIONS

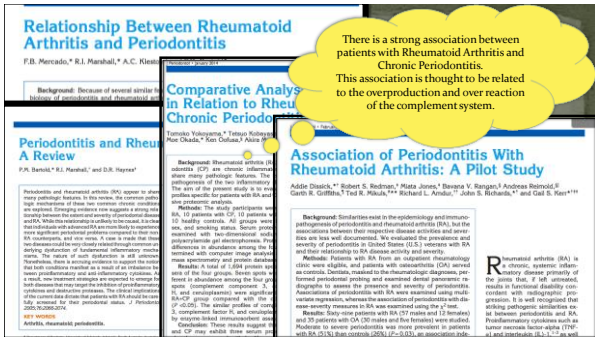
OTHER MANIFESTATIONS

MANIFESTATIONS OF HANDS AND FEET




Rheumatoid Arthritis: Symptom Management

- Many people with Rheumatoid arthritis take the holistic approach and look into foods that would help keep the inflammatory process working.
- There is a drink called "women's greens" which many people use:
- It is composed of many B and E vitamins, chopped ginger root, chopped turmeric root, beets, blueberries, pineapples, apples, other fruits, protein powder (to keep blood sugar from spiking), chia seeds, flax seeds, and pumpkin seeds



Fibromyalgia

- Fibromyalgia is a common and complex chronic pain disorder that affects people physically, mentally and socially. In the past fibromyalgia has also been referred to as fibromyalgia syndrome,fibromyositis and fibrositis. It is characterized by chronic widespread pain, multiple tender points, abnormal pain processing, sleep disturbances, fatigue and often psychological distress. Symptoms can wax and wane, with severe symptoms being extremely debilitating and can interfere with an individuals basic daily activities
- Not yet characterized as an autoimmune disorder however many people suffer with co-morbidities such as: various types of arthritis, degenerative disc disease, celiac disease, autoimmune thyroid conditions, sjögrens syndrome etc.
- Recent studies state 23% to 41% of patients with chronic disabling occupational musculoskeletal disorders have also been diagnosed with fibromyalgia; compared to only 2% to %5 population averages of fibromyalgia occurrence.

Fibromyalgia Cause

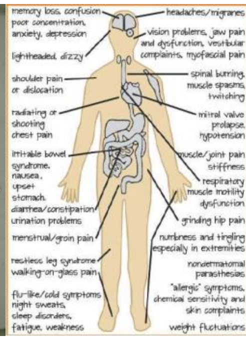
- Recent research has suggested a genetic component. The disorder is often seen in families, among siblings or mothers and their children.
- Fibromyalgia often occurs following a physical trauma, such as an acute illness or injury, which may act as a "trigger" in the development of the disorder.
- Increasing attention is being devoted to the central nervous system as the underlying mechanism of FM. Recent studies have suggested that FM patients have generalized disturbance in pain processing and an amplified response to stimuli that would not ordinarily be painful in healthy individuals.

The Fibromyalgia Patient

- The major oral manifestations of Fibromyalgia are:
  - Temporomandibular disorders: TMD treatment for FM patients should be conservative and directed to the etiologic and perpetuating factors, such as bruxism.
  - Headaches: Nonspecific headaches are reported by 53% to 82% of FM patients, 35% reporting migraines.
  - Oral Complaints: Xerostomia, glossodynia, dysgeusia. These oral manifestations may be medication induced.

Fibromyalgia

Chronic widespread body pain is the primary symptom of fibromyalgia. Most people with fibromyalgia also experience moderate to extreme fatigue, sleep disturbances, sensitivity to touch, light, and sound, and cognitive difficulties. Many individuals also experience a number of other symptoms and overlapping conditions, such as irritable bowel syndrome, lupus and arthritis



Chronic Fatigue Syndrome (CFS)

- Chronic fatigue syndrome, or CFS, is a debilitating and complex disorder characterized by profound fatigue that is not improved by bed rest and that may be worsened by physical or mental activity. Symptoms affect several body systems and may include weakness, muscle pain, impaired memory and/or mental concentration, and insomnia, which can result in reduced participation in daily activities.
- Many patients with fibromyalgia also suffer from CFS.

Recurrent Aphthous Stomatitis

Dysregulation of the Local Immune Response

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Recurrent Aphthous Stomatitis

- Recurrent Aphthous Stomatitis (RAS) is often indicative of an underlying illness, deficiency or may often be a presentation of a systemic autoimmune or inflammatory disorder.
- RAS may not be a truly autoimmune disease but a dysregulation of the local immune response to a variety of irritants or stimuli.

RAS occurs in association with these systemic disorders:
- Behçet syndrome
- Chron Disease
- Ulcerative Colitis
- Cyclic Neutropenia
- Celiac Sprue
- Aphthous Stomatitis
- Pharyngitis
- Adenitis

Recurrent Aphthous Stomatitis

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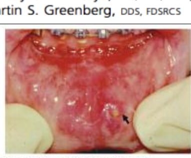

Fig. 1. Minor aphthous ulcer on the lower lip (*black arrow*).

Fig. 2. Major aphthous ulcer on the lower lip (*A*), maxillary unattached gingiva (*B*), and anterior tongue (*C*). The ulcers display characteristic erythematous halo and central yellowish-gray pseudomembrane.

Recurrent Apthous Stomatitis Treatment

Ulcerative

Management

- The list of external factors associated with RAS is very long and contains many dietary items including:
  - Nuts
  - Spices
  - Gluten
  - Acidic Fruits

Treatment

- Principles of treatment include:
  - Ulcer management
  - Pain management
  - Nutritional management
  - Vitamin B_{12} may help to reduce frequency

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KEYWORDS
• Aphthous • Immunologic • Crohn disease • Behçet disease • Nutritional deficiency
• Psychological stress • Topical therapy • Systemic therapy

The denaturing effect of sodium lauryl sulfate (SLS), commonly found in toothpastes, has also been discussed as a cause of RAS. It was proposed that SLS might erode the oral mucin layer, exposing the underlying epithelium, thereby making the individual more susceptible to RAS. This theory still needs further clarification, because it has also been demonstrated that the use of SLS-free toothpastes did not affect the development of new lesions in RAS patients.[52,53]

The Role of Sodium Lauryl Sulfate

- Found in shampoos, soaps, conditioners, cleansers, and toothpastes
- Used to degrease engines and floors
- Added as a foaming agent (surfactant)
- BANNED in Europe and Canada
- Causes:
  - Hair loss
  - Cataracts
  - Rashes
- Affects the brain, heart, liver, and other organs

Ulcerative

Beçhet's Disease (BD)

- Rare chronic, multisystem inflammatory disease which generally begins with ulcers of the oral mucosa, and then is characterized by recurring mucocutaneous lesions of the oral cavity, genitalia, and dermis, involvement of the ocular, vascular, digestive and nervous system.
- Many recent studies have focused on the function of the B and T cells, infectious agent, and the mechanisms involved in thrombophilia (blood clot formation).
- Lesions are well defined with a white to yellowish necrotic base surrounded by a red rim. See picture.

Additional Autoimmune Conditions

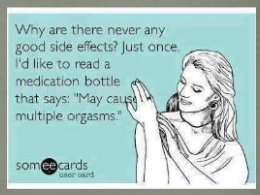
CICATRICIAL PEMPHIGOID	A benign, chronic, blistering disease affecting the oral and genital mucosa, conjunctiva of the eye/skin, and characterized by the healing of lesions with scarring.
FIBROMYALGIA	A widespread, musculoskeletal disorder characterized by pain in the muscles, ligaments, and joints; also is associated with fatigue. Has a frequent comorbidity with other autoimmune conditions, including: chronic fatigue syndrome, rheumatoid arthritis, systemic lupus erythematosus, and hypothyroidism.
HYPERTHYROIDISM	Also known as *thyrotoxicosis*, an excess of thyroxine (T4) and triiodothyronine (T3) in the bloodstream affecting the body's metabolic rate.
HYPOTHYROIDISM	Characterized by autoimmune thyroiditis causing progressive gland deterioration leading to fibrosis and diminished or absent secretion of thyroid hormone.
MULTIPLE SCLEROSIS	The most common autoimmune disease affecting the nervous system characterized by demyelination of nerves in the central nervous system because of chronic inflammation.
MYASTHENIA GRAVIS	A chronic autoimmune disease that affects the neuromuscular system representing a decrease in acetylcholine receptors in muscle fibers resulting in progressive fatigability and abnormality of skeletal muscles.
PEMPHIGUS VULGARIS	A progressive, severe disease affecting the skin and mucous membranes, and is characterized by bullae that rupture and form painful ulcers.

Management & Treatment of Conditions

Management of Symptoms
Treatment of Symptoms
Pain Management

Management

- The management of many inflammatory conditions described today are similar.
- Treatment often begins with the use of topical steroids, analgesics, and antimicrobial treatments, in addition to careful attention to oral hygiene and appropriate fluoride use – discussed later.
- This brief review aims to discuss the presentation/prevalence, diagnosis and treatment of oral manifestations encountered in autoimmune, auto-inflammatory and systemic chronic inflammatory diseases.
- Systemic autoimmune conditions are estimated to effect 5 to 8% of Americans.
- Oral manifestations are often the first clinical sign or symptom; the dental professional may be tasked to play a primary role in the identification/diagnosis of such lesions.



LINKS

- Goodpasture syndrome: (MedlinePlus Medical Encyclopedia)
- Microscopic polyangitis (MPA): (Vasculitis Foundation)
- Mixed connective tissue disease (MCTD): (MayoClinic.com)
- Polymyalgia rheumatica: (MedlinePlus Medical Encyclopedia)
- Polymyositis: (MayoClinic.com)
- Psoriasis: (MayoClinic.com)
- Temporal Arteritis/Giant Cell Arteritis: (MedlinePlus Medical Encyclopedia)
- Wegener's granulomatosis: (Vasculitis Foundation)

Effect on the Dental Practioner

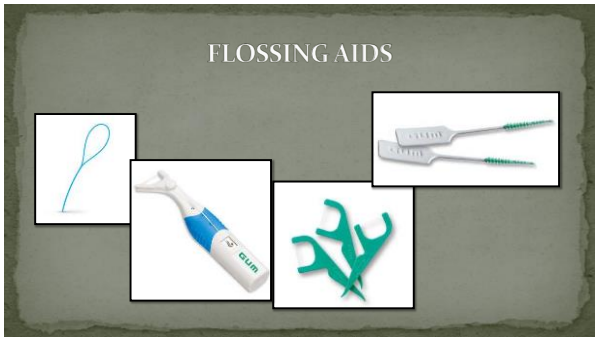
Symptom Management
Supplemental Instructions

The tongue is a small thing, but what enormous damage it can do.

Compassion and Understanding

- People who have developed any autoimmune disorder need our total compassion and understanding. ALL patients deserve compassionate care, however autoimmune diseased patients often encounter bias from healthcare practioners – as they are viewed as medication seeking or hypochondriacs.
- Patients must make significant lifestyle changes, including the total loss of function in hands and feet
- Now having developed this condition, they find that all of these things are an effort and some are just impossible to do any longer.
- All of this becomes frustrating for them and they become depressed.

Difficulty in using Traditional Aids



Recommended Aids			
Xerostomia Aid	Fluoride Content	Product Characteristics	Xerostomia Benefits
Therapeutic Rinse			
Colgate® Dry Mouth Fluoride Mouth Rinse	0.02% Sodium Fluoride	Alcohol Free SLS Free	Enhances Remineralization Intensive Moisturizers Lubrication Properties Coats Mucosal Surfaces[18]
Act® Dry Mouth Rinse	0.02% Sodium Fluoride	Alcohol Free SLS Free Contains Xylitol	Enhances Remineralization Intensive Moisturizers Lubrication Properties Coats Mucosal Surfaces[18] Anti-inflammatory/antioxidant botanicals soothe irritated tissues.[19]
Biotene® Dry Mouth Oral Rinse	None Listed	Alcohol Free SLS Free Contains Xylitol	Intensive Moisturizers Lubrication Properties Coats Mucosal Surfaces[20]
Biotene® PBF Oral Rinse	None Listed	Alcohol Free SLS Free Contains Xylitol	Intensive Moisturizers Lubrication Properties Coats Mucosal Surfaces[20]
Colgate® Phos-Flur®	0.044% Sodium Fluoride Acidulated Phosphate Solution (Content not Listed)	Alcohol Free (Gushing Grape and Bubble Gum only) SLS Free	Enhances Remineralization APF added to aid in the uptake of sodium fluoride. Lubrication Properties 90% greater fluoride uptake than the leading neutral fluoride rinse.[18]

Topical Agent			
GC MI Paste Plus™	0.2% Sodium Fluoride	Contains Recaldent™ Contains CCP-ACP Contains Xyitol SLS Free	Enhances Remineralization Superior Adsorption CPP Inhibits Calculus. Helps to maintain neutral pH [21]
GC MI Paste™	None Listed	Contains Recaldent™ Contains CCP-ACP Contains Xyitol SLS Free	Enhances Remineralization Superior Adsorption CPP Inhibits Calculus Helps to maintain neutral pH.[21]
Community Water Fluoridation	≥0.03 ppm (sodium fluoride, fluorosilicic acid, or sodium fluorosilicate)		Enhances Remineralization Smooth-surface Caries Prevention Lubrication Properties[22]

Dentifrice			
Xerostomia Aid	**Fluoride Content**	**Product Characteristics**	**Xerostomia Benefits**
Biotene® Dry Mouth Fluoride Toothpaste	.014% Sodium Monofluorophosphate	SLS Free Contains Xylitol	Enhances Remineralization[20]
Biotene® PBF Dry Mouth Toothpaste	0.14% Sodium Monofluorophosphate	SLS Free Contains Xylitol Contains Calcium Lactate	Enhances Remineralization Calcium lactate added for anti-calculus benefit[20]
Crest Pro Health™	0.454% Stannous Fluoride	Contains Sodium Hexametaphosphate	Decreases Gingival Bleeding Decreases Gingival Inflammation Decreases Supragingival Calculus.[11]
Arm & Hammer® Toothpastes (Excluding Sensitive Dentifrices)	0.24% Sodium Fluoride	Contains Sodium Carbonate	Enhances Remineralization Elevates Salivary pH Neutralize Plaque Acids Changes Biofilm Composition[12]

Lozenge			
Xerostomia Aid	**Fluoride Content**	**Product Characteristics**	**Xerostomia Benefits**
Act® Dry Mouth Lozenge	None Listed	Contains Xylitol	Salivary Stimulation Lubrication Properties[19]
Chewing Gum			
Biotene® Dry Mouth Chewing Gum	None Listed	Contains Xylitol	Salivary Stimulation Reduces Plaque Between Brushing[20]
Trident® Sugarless gum, Trident® fusion flavors, and Stride gum.		Contains Recaldent® Contains Xylitol	Enhances Remineralization Strengthens tooth enamel more than any other sugar-free gum Gluten Free[23]

We need to be very aware of the trials and tribulations that these patients who suffer from autoimmune conditions are experiencing.

We need to show compassion (as said before), not judge them for lack of home care (many times they are in too much discomfort or are worn out), and give them as much encouragement as possible.

We need to show them home care items that they can use not ones that will be frustrating for them.

We need to know if they are on steroids if:

1. They took the steroid regularly
2. They took it with a meal
3. That they are not worried about the treatment or dental visit that day
4. That their BP is normal and not high

All of these things will effect the patient visit that day.

We need to make our patients with autoimmune conditions as comfortable as possible.

MAKING LEMONADE OUT OF LEMONS

THANK YOU!

WITH GRATITUDE

- Water Pik :

MANY THANKS

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