Nutritional Management in Rheumatoid Arthritis

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Objectives:

• Understand the pathophysiology of RA.

• Review signs and symptoms of RA.

• Understand how these conditions affects a persons everyday life.

• Nutritional Management of RA-

• Research articles
Arthritis:

- “arthr” = joint
- “itis” = inflammation
- “Arthritis can affect babies and children, as well as people in the prime of their lives”
Myths:

• Arthritis isn’t serious
• Arthritis is an old person’s disease
• Arthritis is a normal part of aging
• Not much can be done for those living with arthritis
• People with arthritis can’t exercise

(Arthritis Foundation, 2012)
The difference......

<table>
<thead>
<tr>
<th>Rheumatoid Arthritis</th>
<th>Osteoarthritis</th>
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<tbody>
<tr>
<td>A chronic inflammatory disorder in which membranes around joints become inflamed and release enzymes that cause the surrounding cartilage and bone to wear away.</td>
<td>Occurs because of the loss of cartilage between bones.</td>
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<tr>
<td>Affects the lining of your joints, causing a painful swelling that can eventually result in bone erosion, joint deformity and immobility.</td>
<td>The main difference between osteoarthritis and rheumatoid arthritis is the cause behind the joint symptoms.</td>
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</tbody>
</table>
Rheumatoid Arthritis:

(The Arthritis Society, 2012; Gulanick & Myers, 2011; Firth, 2011)
Osteoarthritis:

Normal joint

Joint affected by osteoarthritis

Bone spur (osteophyte)

Thinned cartilage

Cartilage fragments
Nodules Involved:
Symptoms

- **Swelling in joints** (Specially in small joints)
- **Red and Puffy Hands**
- **Joint Pain** (Early morning stiffness lasting more than one hour)
- **Back Pain** (Specially in Men)
- **Tightening of Skin**
- **Skin Rashes**
- **Weight Loss**

Causes

An autoimmune disorder, it occurs when the white blood cells which generally help maintain immunity move from the bloodstream into the membrane surrounding the joints, it results in inflammation blood cells play role in causing the synovium to become inflamed.
Diagnosis:

• *No single test is specific to Rheumatoid Arthritis*
Inflammatory Markers: ESR and CRP Test

• The level of CRP in the blood is normally low
• Increasing amount suggests inflammation

• ESR rates for men: 0-15mm/hr
• ESR rates for women: 0-20mm/hr
Antibody Tests:
Other blood tests check for the presence of antibodies that are not normally present in the human body.

- Direct arthroscopy

- **Arthrocentesis**: synovial fluid is aspirated and analysed for inflammatory components

- Synovial membrane biopsy **Abnormal synovial fluid**: cloudy, milky, or dark yellow containing leukocytes

(National Rheumatoid Arthritis Society, 2012; Day et al., 2010)
CT/MRI scans:

- Used for better visualization of soft tissue
- Can detect changes of Rheumatoid Arthritis prior to an X-Ray

X-Ray:

- X-rays are an important diagnostic test for monitoring the disease progression but not in the early stage.
Medications:

- There are four types of medications used to treat RA:
  - Non-steroidal anti-inflammatory drugs (NSAIDs)
  - Disease-modifying anti-rheumatic drugs (DMARDs).
  - Corticosteroids
  - Biologic Response Modifiers ("Bioligics")

(Arthritis Foundation, 2012; Gulanick & Myers 2011)
Non-steroidal anti-inflammatory drugs (NSAIDs):

<table>
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<tr>
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<th>General Use</th>
<th>Side Effects</th>
<th>Nursing Considerations</th>
</tr>
</thead>
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<tr>
<td>• Aspirin,</td>
<td>• anti-inflammatory: Used in the management inflammatory conditions</td>
<td>• Nausea</td>
<td>• Use cautiously in patients with hx of bleeding disorders</td>
</tr>
<tr>
<td>• ibuprofen,</td>
<td>• Antipyretic: used to control fever</td>
<td>• Vomiting</td>
<td>• Encourage pt to avoid concurrent use of alcohol</td>
</tr>
<tr>
<td>• naproxen,</td>
<td>• Analgesic: Control mild to moderate pain</td>
<td>• Diarrhea</td>
<td>• NSAIDs may decrease response to diuretics or antihypertensive therapy</td>
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<tr>
<td>• COX-2 inhibitors,</td>
<td></td>
<td>• Constipation</td>
<td></td>
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<tr>
<td>• propionic acid,</td>
<td></td>
<td>• Dizziness</td>
<td></td>
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<tr>
<td>• phenylacetic acid</td>
<td></td>
<td>• Edema</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>• Kidney failure</td>
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<td></td>
<td></td>
<td>• Liver failure</td>
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<tr>
<td></td>
<td></td>
<td>• Prolonged bleeding</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>• Ulcers</td>
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(The Arthritis Society, 2011; Day et al., 2010)
# Corticosteroids

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<tr>
<td>Cortisone,</td>
<td>• Used in the management inflammatory conditions</td>
<td>• Increased appetite</td>
<td>• Take medications as directed (adrenal suppression)</td>
</tr>
<tr>
<td>hydrocortisone,</td>
<td>• When NSAIDS may be contraindicated</td>
<td>• Weight gain</td>
<td>• Used with caution in diabetic patients</td>
</tr>
<tr>
<td>prednisone,</td>
<td>• Promptly improve symptoms of RA</td>
<td>• Water/salt retention</td>
<td>• Encourage diet high in protein, calcium, potassium and</td>
</tr>
<tr>
<td>betamethasone,</td>
<td></td>
<td>• Increased blood pressure</td>
<td>low in sodium and carbohydrates</td>
</tr>
<tr>
<td>dexamethasone</td>
<td></td>
<td>• Thinning of skin</td>
<td>• Discuss body image</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Depression</td>
<td>• Discuss risk for infection</td>
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<tr>
<td></td>
<td></td>
<td>• Mood swings</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>• Muscle weakness</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>• Osteoporosis</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Delayed wound healing</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Onset/worsening of diabetes</td>
<td></td>
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(The Arthritis Society, 2011; Day et al., 2010)
Disease-modifying anti-rheumatic drugs (DMARDs):

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<td>Methotrexate (the gold standard), gold salts, cyclosporine, sulfasalazine, azathioprine</td>
<td>• Immunosuppressive activity • Reduce inflammation of rheumatoid arthritis • Slows down joint destruction • Preserves joint function</td>
<td>• Dizziness, drowsiness, headache • Pulmonary fibrosis • Pneumonitis • Anorexia • Nausea • Hepatotoxicity • Stomatitis • Infertility • Alopecia • Skin ulceration • Aplastic anemia • Thrombocytopenia • Leukopenia • Nephropathy • Fever • Photosensitivity</td>
<td>• May take several weeks to months before they become effective • Discuss teratogenicity, should be taken off drug several months prior to conception • Discuss body image</td>
</tr>
</tbody>
</table>
Exercise:

- 4 times a week for 30 minutes
- Walking
- Light jogging
- Water aerobics
- Cycling
- Yoga
- Stretching

Arthritis Foundation, 2012
Nutrition Therapy In Rheumatoid Arthritis

eat well to live well

PAKISTAN NUTRITION & DIETETIC SOCIETY- CNE APRIL 2014
Malnutrition?......

- Patients with RA are at nutritional risk for many reasons.
- Weight loss and cachexia linked to cytokine production.

In patients experiencing:
- Chronic inflammation
- Production of Cytokines (cell signaling proteins), such as interleukin-1 and *tumor necrosis factor (TNF).*
- Increases resting metabolic rate and protein breakdown.
- The challenge of increasing both calorie and protein intake to meet the nutritional requirements of the increased metabolic rate.

* The primary role of TNF is in the regulation of immune cells. TNF is able to induce fever, cell death, cachexia, inflammation and to inhibit tumor genesis.
Factors effecting Nutritional Status:

• The effects of arthritis medications that are frequently taken long-term.

• Patients receiving methotrexate, where patients are frequently identified with folic acid deficiency.

• Prolonged dosing of other RA medications may be associated with conditions such as gastritis or peptic ulcer.

• Use of steroid based medications that trigger calcium Vit D balance.

• In case of Peptic ulcer/gastritis, oral intake is compromised hence leading to low hemoglobin levels and suppressed immunity.
The major goal is to relieve pain, inflammation and prevent further joint damage. Potentially pause, if not reverse the disease process.

Anxiety, depression, and a low self esteem commonly accompanies Rheumatoid Arthritis.

(Walker, 2012; Gulanick & Myers, 2011; The Arthritis Society, 2011; Firth, 2011)
Nutritional Causes of AI Disease

- Environmental toxins including heavy metals (like lead and mercury)
- Oxidative stress
- Increased free radicals
- Fatty acid imbalance
- Bacterial challenges
- Vitamin D deficiency

Research on diet and AI Disease indicates:

- High cruciferous vegetable intake
- Plant-based diet from whole foods
- Vitamin D adequacy
- Fish oil

Major nutrients known to affect Immunity

- Fatty acids
- Iron
- Protein
- Selenium
- Vitamin A, Vit D, Vit E
- Folate, Vitamin B6, Vitamin C
- Zinc
**Nutrition Protocol**

1. Keep a detailed daily food/symptom.
2. Reduce animal products while removing processed, packaged foods--
   - *Practice veganism, for a period of time until inflammatory lab markers have decreased.*
   - Dairy products (milk and cheese).
3. Dietary avoidance of salt, wheat, and gluten.
4. Whole food, plant-based diet, rich in greens and *crucifers-rich in antioxidants, phytochemicals, and omega-3 fatty acids.*
5. Make vegetable/fruit smoothies and blended soups.
   - *Balance simple blended sugars with fat, fiber and protein to delay blood sugar absorption and to reduce inflammation.*
6. Enjoy fresh juice with veggies, soups.
7. Take EPA and DHA (fish oil) to reduce inflammation.
   - 1 teaspoon of fish oil for 1-3 months.
   - 1 Tbsp. flax seed daily.
8. Consume cultured and fermented foods to promote gut integrity.
Foods to limit or avoid

• Eat fewer refined grains, such as:
  – White bread
  – Pastries
  – Desserts made with white flour
• Consume less sugar—use caution when consuming sugar, which has a possible connection to inflammation
• Avoid saturated fats and trans fats
• Remember, no definitive research exists to show that all grains are detrimental to our inflammatory response.

• Whole foods are always the best choice.

Most common Vitamin & Mineral Deficiencies

• Supplementation of **calcium and vitamin D** is recommended to decrease the risk of osteoporosis that results from nutritional loss of these supplements, from menopause and from steroid therapy.

• **Fish oil capsules** - Studies have shown **an improvement in RA symptoms** over the short term with **a diet high in omega-3s and/or fish oil supplements**.

• Flaxseed
• Walnuts
• Soy
• Canola oil

http://www.hopkinsarthritis.org/patient-corner/disease-management/rheumatoid-arthritis-nutrition/
Guide to Nutrition Therapy:

• No evidence exists to prove that foods from the family, such as potatoes, tomatoes, eggplant, and sweet and hot peppers, make your symptoms worse.

• Because RA symptoms can wax and wane suddenly and without apparent cause, it is easy to tie them to foods.

• If you seem to notice a connection to certain foods, you may choose to avoid them.

• However, use caution when avoiding certain foods, because this could cause you to miss certain nutrients that your body needs for good health.

Important Minerals/Vitamins Required.

Vitamin A:
• A research at La Jolla Institute for Allergy & Immunology in California in mice suggested that a Vitamin A derivative, retinoic acid, may fight autoimmune and inflammatory diseases such as RA through affecting pro-inflammatory T-cells.
• Dosage: 10,000 units daily

Vitamin B Complex:
• Evidence from trials suggests that Vitamin (Niacin)B3, (Folic Acid)B9 and Cobalamin)B12 may be beneficial for treating OA in terms of improvement in joint mobility and grip strength. B6 is said to be able to reduce levels of markers of inflammation in RA.
• Dosage: 50-75mg of each B Vitamins in divided doses
Vitamin C:

- Researchers found RA patients require *supplementation in high doses in order to maintain acceptable plasma vitamin C levels.*
- Low vitamin C levels in the blood, *below-normal ascorbic acid concentrations had also been observed in the synovial fluid of RA patients.*
- *The effect of intravenous vitamin C (IVC) treatment on subjects with RA demonstrated that IVC therapy with dosages of 7.5 g-50g can reduce inflammation and the pain levels.*
- Dosage (common): 2 to 8g with every meal per day.
Vitamin E

• Dr Roubenoff, MD rationalizes that:

• People with RA not only have increased free radicals, but reduced vitamin E, C, and beta carotene,” which may result from using up these antioxidants.

• Dosage: 400IU of mixed tocopherols twice daily.
Probiotic supplementation improves inflammatory status in patients with rheumatoid arthritis.

OBJECTIVES:
• The objective of the present clinical trial was to assess the effects of probiotic supplementation on disease activity and inflammatory cytokines in patients with RA.

CONCLUSIONS:
• *L. casei* 01 (*Lactobacillus casei*) supplementation improved the disease activity and inflammatory status of patients with RA. Further studies are warranted to confirm these results, and such confirmation may lead to the introduction of probiotics as adjunctive therapy for this population.

Vitamin D status is associated with disease activity among rheumatology outpatients.

OBJECTIVE:
- To determine vitamin D status in known cases of common SARDs and compare to those with non-autoimmune diseases; further, to evaluate the impact of vitamin D on disease activity in rheumatoid arthritis (RA) cases.

CONCLUSION:
- Inadequate vitamin D status in SARDs cases, along with considerably strong association with disease activity in RA cases, indicate the need for proper evaluation of vitamin D status in this clinical population. Moreover, appropriate training should be given to the patients to ensure the intake of the recommended amount of vitamin D per day through diet or supplement.

Folic acid and folinic acid for reducing side effects in patients receiving methotrexate for rheumatoid arthritis.

BACKGROUND:

• Methotrexate (MTX) is a disease modifying ant rheumatic drug (DMARD) used as a first line agent for treating rheumatoid arthritis (RA). Pharmacologically, it is classified as an ant metabolite due to its antagonistic effect on folic acid metabolism. Many patients treated with MTX experience mucosal, gastrointestinal, hepatic or hematologic side effects. Supplementation with folic or folinic acid during treatment with MTX may ameliorate these side effects.

OBJECTIVES:

• To identify trials of supplementation with folic acid or folinic acid during MTX therapy for rheumatoid arthritis
• To assess the benefits and harms of folic acid and folinic acid (a) in reducing the mucosal, gastrointestinal (GI), hepatic and hematologic side effects of MTX, and (b) whether or not folic or folinic acid supplementation has any effect on MTX benefit.

Cochrane Database Syst Rev. 2013 May 31
Author’s Conclusion

- The results support a protective effect of supplementation with either folic or folinic acid for patients with rheumatoid arthritis during treatment with MTX.
- There was a significant reduction shown in the incidence of GI side effects, hepatic dysfunction (as measured by elevated serum transaminase levels) as well as a significant reduction in discontinuation of MTX treatment for any reason.
- A trend towards a reduction in stomatitis was demonstrated however this did not reach statistical significance. This updated review with its focus on lower doses of folic acid and folinic acid and updated assessment of risk of bias aimed to give a more precise and more clinically relevant estimate of the benefit of folate supplementation for patients with rheumatoid arthritis receiving methotrexate.

Omega-3 polyunsaturated fatty acids and the treatment of rheumatoid arthritis: a meta-analysis.

AIMS:
- To assess the effects of omega-3 polyunsaturated fatty acids (PUFAs) (administered at ≥2.7 g/day) for a minimum duration of 3 months on clinical outcomes in patients with rheumatoid arthritis (RA).

CONCLUSIONS:
- Results suggest that the use of omega-3 PUFAs at dosages >2.7 g/day for >3 months reduces NSAID consumption by RA patients.
- Further studies are needed to explore the clinical and NSAID-sparing effects of omega-3 PUFAs in RA.

Nutritional status in relation to adipokines and oxidative stress is associated with disease activity in patients with rheumatoid arthritis.

OBJECTIVE:

Whether disease activity was associated with dietary habits, nutritional status, *adipokines, and oxidative stress in patients with rheumatoid arthritis.

METHODS:

• 37 patients with RA.
• The assessment of nutritional status (anthropometric and biochemical parameters)
• A food-frequency questionnaire and a 3-d diet record
• The serum levels of adipokines and oxidative stress markers in sera and saliva were measured. We divided the subjects into high (DAS28 ≥3.2) and low (DAS28 <3.2) disease activity groups.

CONT....
CONCLUSION:

• Altered serum adipokine levels with decreased albumin may reflect the deterioration that is associated with rheumatoid arthritis.
• An increased oxidative stress was observed in sera and saliva.
• Intakes of ω-3 polyunsaturated fatty acids, fish oil, and monounsaturated fatty acid seem to affect disease activity and may have beneficial effects by decreasing inflammation.


Case Study

- A 53-year-old female with weight = 80 kg, height = 152 cm, BMI = 34 kg/m²
- Presented with symptoms included fatigue, irritable bowel syndrome-associated constipation (IBS-C), gastro esophageal reflux (GERD), menopausal symptoms, chronic urinary tract and upper respiratory infections, and weight gain.

Despite the debilitating pain, she had discontinued three prescribed medications – hydroxychloroquine, methotrexate, and prednisone – against medical advice.

She experienced some intolerable side effects. An initial comprehensive laboratory evaluation identified nutrient and essential element deficiencies in addition to elevated high sensitivity C-reactive protein (hs-CRP).
What is your nutritional assessment criteria for this patient

- BEE = 1463
- Total required calories = 1800 Calories
- Proteins = 67-70 gm
- CHO = 247-250 gm
- Fats = 60 gm

- Pt. at risk of malnutrition
- May develop anemia
- Pt. is obese and other risk factors will get involved includes HTN, DM.
- Use of hydroxychloroquine causes diarrhea and vomiting.
- Electrolyte imbalances.
In lieu of the medications, what are the risk factors you identified regarding her condition and what were the side effects she suffered from?

- Obesity
- Osteoporosis
- Vitamin D, Calcium deficiency
- Folic acid deficiency
- Anemia

**What would be your long term nutrition therapy to decrease the symptoms**

- A well-balanced diet rich in calcium and vitamin D.
- Sources of calcium include low-fat dairy products; dark green, leafy vegetables; and calcium-fortified foods and beverages.
- **Supplements** can help to provide adequate amounts of calcium.
- Daily calcium intake of 1,200 mg daily.
How will you counsel this patient in relation to long term treatment with steroids and her dietary intake.

- Well balanced high fiber low saturated fat diet
- Intact nutrition supplement advised
- Intake of anti-oxidant rich foods (fresh fruits, vegies, juices, green smoothies)
- Multi vitamins (iron, folic acid, b-complexes)
- Good fluid intake

**Exercise.**

- Exercising can be challenging for people with rheumatoid arthritis, and it needs to be balanced with rest when the disease is active.
- Regular exercise, such as walking, can help prevent bone loss and, by enhancing balance and flexibility, can reduce the likelihood of falling and breaking a bone.
- Important for preserving joint mobility.
ANY QUESTIONS?