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Treatment Models for Rheumatoid Arthritis- A Review

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Abstract

Aim:

To present a review on various treatment models available for Rheumatoid arthritis

Objective:

The Objective of this review is to present information about various biological agents, herbs, disease modifying anti rheumatoid drugs (DMARD), used for the treatments of Rheumatoid arthritis

Background:

Rheumatoid arthritis is an autoimmune disease causing inflammation in the joints resulting in painful deformity and immobility especially in the fingers, wrist ,feet and ankle. Till now there is no complete cure for Rheumatoid arthritis

Reason:

Number of rheumatoid arthritis patients are increasing day by day. This review provides information about various biological and traditional drugs for the treatment of Rheumatoid arthritis

Result:

Treatment models of rheumatoid arthritis has been reviewed

Keywords- Rheumatoid arthritis, disease modifying antirheumatic drugs, NSAID.

INTRODUCTION

Rheumatoid arthritis (RA) is a long-lasting auto immune disorder that primarily affects joints. It typically results in warm, swollen, and painful joints. Pain and stiffness often worsen following rest. Most commonly, the wrist and hands are involved, with the same joints typically involved on both sides of the body. The disease may also affect other parts of the body. This may result in a low red blood cell count, inflammation around the lungs, and inflammation around the heart. Fever and low energy may also be present.[1]. It also affects the underlying bone and cartilage .[1] The diagnosis is made mostly on the basis of a person's signs and symptoms.[2] X rays and laboratory testing may support a diagnosis or exclude other diseases with similar symptoms.[1]. Rheumatoid arthritis is a common disease, and it produces substantial morbidity as well as an increase in mortality [3, 4, 5]. Accurate diagnosis of rheumatoid arthritis may be difficult early in its course and demands high clinical suspicion, astute examination, and appropriate investigations. Early use of disease-modifying anti rheumatic drugs and biologics has improved outcomes but requires close monitoring of disease course and adverse events [6].Doctors recommend early diagnosis and aggressive treatment to control RA. [7]. Researchers have shown that people with a specific genetic marker called the HLA shared epitope have a fivefold greater chance of developing rheumatoid arthritis than do people without the marker. The HLA genetic site controls immune responses [12]

The symptoms of rheumatoid arthritis includes, Joint pain, tenderness, swelling or stiffness for six weeks or longer Morning stiffness for 30 minutes or longer More than one joint is affected Small joints (wrists, certain joints of the hands and feet) are affected The same joints on both sides of the body are affected Along with pain, many people experience fatigue, loss of appetite and a low-grade fever [13]

RA affects between 0.5 and 1% of adults in the developed world with between 5 and 50 per 100,000 people newly developing the condition each year [8] In 2010 it resulted in about 49,000 deaths globally.[9]

Onset is uncommon under the age of 15 and from then on the incidence rises with age until the age of 80. Women are affected three to five times as often as men.[10].The age at which the disease most commonly starts is in women between 40 and 50 years of age, and for men somewhat later.[11]

RHEUMATOID ARTHRITIS

Causes

RA is a chronic autoimmune disorder the causes of which are not completely understood. It is a systemic disorder principally affecting synovial tissues. There is no evidence that physical and emotional effects or stress could be a

trigger for the disease. The many negative findings suggest that either the trigger varies, or that it might in fact be a chance event inherent with the immune response.[14]. Half of the risk for RA is believed to be genetic [3]. Smoking is the most significant non-genetic risk [3] with RA being up to three times more common in smokers than non-smokers, particularly in men, heavy smokers, and those who are rheumatoid factor positive [15]. Vitamin D deficiency is more common in people with rheumatoid arthritis than in the general population.[16][17]However, whether vitamin D deficiency is a cause or a consequence of the disease remains unclear.[18] 1α,25-dihydroxyvitamin D3 (1,25D), an active metabolite of vitamin D, affects bone metabolism indirectly through control of calcium and phosphate homeostasis.

Treatment

There is no cure for RA, but treatments can improve symptoms and slow the progress of the disease. Disease-modifying treatment has the best results when it is started early and aggressively.[19]

The goals of treatment are to minimize symptoms such as pain and swelling, to prevent bone deformity (for example, bone erosions visible in X-rays), and to maintain day-to-day functioning.[20][] This can often be achieved using two main classes of medications: analgesics such as non-steroidal anti-inflammatory drugs (NSAID), and disease-modifying anti rheumatic drugs (DMARDs).[21] RA should generally be treated with at least one specific anti-rheumatic medication.[19]

Lifestyle

Regular exercise is recommended as both safe and useful to maintain muscles strength and overall physical function.[22] It is uncertain if specific dietary measures have an effect.[23] Physical activity is beneficial for persons with Rheumatoid arthritis complaining of fatigue.[24].

Disease modifying agents

Disease-modifying antirheumatic drugs (DMARDs) are the primary treatment for RA.[8]They are a diverse collection of drugs, grouped by use and convention. They have been found to improve symptoms, decrease joint damage, and improve overall functional abilities,[8]DMARDs should be started early in the disease as they result in disease remission in approximately half of people and improved outcomes overall.[25] The following drugs are considered as disease modifying antirheumatic drugs methotrexate, hydroxychloroquine, sulfasalazine, lefluno mide, TNF-alpha inhibitors (certolizumab , infliximab andetanercept), abatacept, and anakinra. Rituximab and tocilizumab are monoclonal antibodies and are also DMARDs.

The most commonly used agent is methotrexate. Methotrexate is the most important and useful DMARD and is usually the first treatment.[20][21][26].

Adverse effects should be monitored regularly with toxicity including gastrointestinal, hematologic, pulmonary, and hepatic.[26]Side effects such as nausea, vomiting or abdominal pain can be reduced by taking folic acid.[27]The most common undesirable effect is that it increases liver enzymes in almost 15% of people.[26] It is thus recommended that those who consistently demonstrate abnormal levels of liver enzymes or have a history of liver disease or alcohol use undergo liver biopsies.[28].

Biological agents should generally only be used if methotrexate and other conventional agents are not effective after a trial of three months.[29] They are associated with a higher rate of serious infections as compared to other DMARDs.[30]These agents used to treat rheumatoid arthritis include: tumor necrosis factor alpha (TNFα) blockers[8] such as infliximab; interleukin 1 blockers such asanakinra, monoclonal antibodies against B cells such as rituximab and tocilizumab,[31].

They are often used in combination with either methotrexate or leflunomide.[8] In those who are well controlled on TNF blockers decreasing the dose does not appear to affect overall function.[32]Persons should be screened for latent tuberculosis before starting any TNF blockers therapy to avoid reactivation.[33]

Anti-inflammatory agents

NSAIDs reduce both pain and stiffness in those with RA.[8]Generally they appear to have no effect on people's long term disease course and thus are no longer first line agents.[8][34]NSAIDs should be used with caution in those with gastrointestinal, cardiovascular, or kidney problems.[35][36][37].

Use of methotrexate together with NSAIDS is safe[38]. COX-2 inhibitors, such as celecoxib, and NSAIDs are equally effective.[39]They have a similar gastrointestinal risk as an NSAIDs plus a proton pump inhibitor.[40]In the elderly there is less gastrointestinal intolerance to celecoxib than to NSAIDs alone.[41]There however is an increased risk of myocardial infarction with COX-2 inhibitors.[][39] Anti-ulcer medications are not recommended routinely but only in those high risk of gastrointestinal problems.[42] Glucocorticoids can be used in the short term for flare-ups, while waiting for slow-onset drugs to take effect.[8]Injection of glucocorticoids into individual joints is also effective.[8]While long-term use reduces joint damage it also results in osteoporosis and susceptibility to infections, and thus is not recommended.[8]

Surgery

In early phases of the disease, an arthroscopic or open synovectomy may be performed. It consists of the removal of the inflamed synovia and prevents a quick destruction of the affected joints. Severely affected joints may require joint replacement surgery, such as knee replacement.[8]Postoperatively, physiotherapy is always necessary.

Alternative medicine

In general, there is not enough evidence to support any complementary health approaches for RA, with safety concerns for some of them but there is not enough evidence

to draw conclusions.[39] A 2005 Cochrane review states that low level laser therapy can be tried to improve pain and morning stiffness due to rheumatoid arthritis as there are few side-effects.[43] There is some evidence that Tai Chi improves the range of motion of a joint in persons with rheumatoid arthritis.[44]The evidence for acupuncture is inconclusive[45] with it appearing to be equivalent to sham acupuncture.[46]

Dietary Supplements

Omega-3

Some evidence supports omega-3 fatty acids and gamma-linolenic acid in RA.[47]The benefit from omega-3 appears modest but consistent, [48] though the current evidence is not strong enough to determine that supplementation with omega-3 polyunsaturated fatty acids (found in fish oil) is an effective treatment for RA.[49] Gamma-linolenic acid, which may reduce pain, tender joint count and stiffness, is generally safe.[50]

Herbal medicine

The American College of Rheumatology states that no herbal medicines have health claims supported by high quality evidence and thus they do not recommend their use.[51]There is no scientific basis to suggest that herbal supplements advertised as "natural" are safer for use than conventional medications as both are chemicals. Herbal medications, although labelled "natural", may be toxic or fatal if consumed.[51]

Due to the false belief that herbal supplements are always safe, there is sometimes a hesitancy to report their use which may increase the risk of adverse reaction.[5]

The following are under investigation for treatments for RA, based on preliminary promising results (not recommended for clinical use yet) : boswellic acid,[52] curcumin,[53] Devil's claw,[54][55] Euonymus alatus,[56] and Thunder god vine (*Tripterygium wilfordii*).[57] NCCIH has noted that, "In particular, the herb thunder god vine (Tripterygium wilfordii) can have serious side effects.

Vaccinations

People with RA have an increased risk of infections and mortality and recommended vaccinations can reduce these risks.[58]The killed influenza vaccine should be received annually.[59]The pneumococcal vaccine should be administered twice for people under the age 65 and once for those over 65 years of age .[60] Lastly, the live-attenuated vaccine should be administered once after the age 60, but is not recommended in people on a tumour necrosis factor alpha blocker[61]

CONCLUSION

The main cause for rheumatoid arthritis is genetic, though smoking remains a major non genetic cause. The treatment models available for rheumatoid arthritis such as, NSAID, DMARD, alternative medicine has been reviewd in this article. Though there are many treatment models available for rheumatoid arthritis,still there is a lack in complete cure for the disease. Research has to be geared up for a complete cure of the disease.

ABBREVATIONS;

RA: Rheumatoid arthritis

DMARD: Disease modifying antirheumatic drugs

NSAID: Non steroidal anti-inflammatory drugs

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