DMARDS AND IMMUNOSUPPRESSIVE DRUGS. pdf

1: Rheumatoid Arthritis Treatment Options | Johns Hopkins Arthritis Center

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Nitrogen mustard Mustargen What are immunosuppressive medications? Immunosuppressives are medications that help suppress the immune system. Many were originally used in patients who received organ transplants to help prevent their bodies from rejecting the transplanted organ. However, these drugs are now also used for the treatment of certain autoimmune diseases, such as lupus and rheumatoid arthritis. Most immunosuppressives work to downregulate suppress this attack by interfering with the synthesis of DNA, the material in your cells that contains the blueprints for all of your genetic information. In doing this, these medications prevent the cells of your immune system from dividing. When cells cannot divide correctly, they will eventually die. The immunosuppressives prescribed most commonly for the treatment of lupus are azathioprine Imuran , mycophenolate Cellcept , and cyclosporine Neoral, Sandimmune, Gengraf. Immunosuppressive medications are used to control more serious lupus activity that affects major organs, including the kidney, brain, cardiovascular system, and lungs. Before prescribing an immunosuppressive medication, your doctor may perform a biopsy of the kidney or affected organ system to evaluate the most effective course of treatment. Sometimes immunosuppressive medications are given in addition to or instead of steroid therapy to lower the dose of steroids needed and thus spare some of the undesirable side effects of steroid therapy. Steroid-sparing drugs usually have a two-fold benefit, since they often reduce or eliminate the need for steroids while also improving lupus symptoms. Because immunosuppressive drugs put down the immune system, people taking them are at an increased risk for infection. Try to stay away from people who have colds or other illnesses, and make sure to wash your hands regularly and maintain good personal hygiene. If you are also taking steroid medications, you may not realize that you are ill because the steroid may suppress your fever symptoms. Contact your doctor immediately at the first sign of any infection or illness. In addition, immunosuppressive medications are known to increase the risk of cancer development later in life. However, lupus itself is also known to increase the risk of cancer, so by controlling your lupus now and preventing it from doing further damage to your body, immunosuppressive therapy may actually decrease your risk of developing cancer. Either way, it is very important to control your lupus activity now to prevent other potentially life-threatening complications. Types of Immunosuppressive Medications Azathioprine Imuran Imuran is an anti-inflammatory immunosuppressive that can decrease joint damage and disability in people with lupus, rheumatoid arthritis, and other conditions. In addition, Imuran has proven to clearly improve lupus affecting the liver and kidneys. Since the side effects of steroids generally increase with the dosage, this medication generally promotes a reduction in steroid side effects as well. People with lupus have overactive immune systems. Imuran works by preventing some of the cells involved in this immune response specifically, white blood cells [WBCs], or leukocytes from spreading. It usually comes in pill form and has fewer side effects than many other immunosuppressive medications. The most common and serious side effects involve the stomach and blood cells. Nausea and vomiting can occur, sometimes with stomach pain and diarrhea. Taking the medication with food may help to reduce these symptoms. Imuran can also decrease the number of certain cells in your blood. For this reason, blood tests should be done regularly to determine your white blood cell, platelet, and red blood cell count. Less common side effects include liver test abnormalities, hepatitis inflammation of the liver , pancreatitis inflammation of the pancreas, a gland behind the stomach, that can cause abdominal pain , or an allergic reaction that can seem like the flu. During treatment, your doctor may perform tests for breakdown products metabolites of Imuran that can help monitor how your body is reacting to the drug. Even though Imuran is effective in treating serious lupus symptoms, long term use of this medication does increase the risk of developing cancer. Your doctor can speak with you about this risk and any other concerns you may have. In addition to having regular blood tests CBCs , you should notify your doctor if you experience any of the following symptoms while taking Imuran: Be sure to speak with your doctor before taking getting any vaccines or having surgery. In addition, consult your doctor

if you are pregnant, may become pregnant, or are breastfeeding, since Imuran can be harmful to your child. Certain medications may interfere with Imuran, so be sure to notify your doctor of any other drugs you are taking. Mycophenolate mofetil Cellcept Cellcept is an immunosuppressant used especially for lupus patients with signs of kidney disease. It works by targeting an enzyme in the bodyâ€"a protein responsible for certain chemical reactionsâ€"that is important in the formation of DNA in your cells. In doing so, Cellcept impairs your immune system function as well. Usually Cellcept is given twice a day for a total dose of about milligrams mg per day, but this dosage may be reduced. Like Imuran, Cellcept is steroid-sparing, so it may allow you and your doctor to reduce your dosage of steroid medications and thus also reduce their side effects. Cellcept may cause some side effects. Headache, dizziness, sleeplessness, and tremors involuntary muscle movements may also occur. Skin rashes can arise but are less common. Since lupus can also cause skin rashes, it may be difficult to determine whether a rash is from your medication or your lupus. You should speak with your doctor upon detecting any new rashes or symptoms. Cellcept may also cause a reduction in the number of certain cells in your blood. A reduction in your white blood cell count could increase your chance of infection. As with other immunosuppressive medications, it is important that you try to avoid infection and notify your doctor at the first sign of illness. In addition, a reduction in red blood cells caused by Cellcept may lead to anemia, which could make you tired or lead to easy bruising. Cellcept can also reduce the number of platelets in your blood, which may also cause easy bruising or gastrointestinal bleeding bleeding anywhere along the pathway that food travels in the body. Obtaining periodic blood tests while taking Cellcept can help you and your doctor to detect and correct these problems. Blood tests should be performed frequently during the first several months of taking this medication and less often as more time passes. People over 65 and those that have experienced ulcers or other gastrointestinal disorders should speak to their doctors before taking Cellcept. People in these groups may experience an increased risk of side effects. In addition, there may be an increased risk of developing cancer such as lymphoma and skin cancer when taking immunosuppressives such as Cellcept. You should discuss this with your doctor before beginning this medication. It is important to realize, however, that Cellcept may be the best way to control the kidney disease associated with lupus, and that lupus too can cause cancer. Thus, prescribing Cellcept for your kidney involvement is not meant to introduce new risk factors, but rather to treat the seriousness of your condition at this moment in time. In addition, be sure to wear sunscreen when going outside and avoid prolonged sun exposureâ€"even if you are not taking immunosuppressive medicationsâ€"since sunlight can also aggravate your lupus symptoms. If you are pregnant, may become pregnant, or are breast-feeding, your doctor will strongly recommend that you stop taking Cellcept due to the risk of birth defects. In addition, even though it is not known whether Cellcept decreases the effectiveness of oral contraceptives, it may be able to reduce their concentration in the blood, so other forms of birth control are advised. If you need to take an antacid, do so at least one hour before or at least two hours after taking Cellcept. As with other immunosuppressive medications, you should speak to your doctor before getting any vaccines or having any sort of surgery. Certain drugs may interact or interfere with the effectiveness of Cellcept. Be sure to notify your doctor immediately if you experience easy bruising or bleeding, persistent or bloody diarrhea, trouble breathing, fever, or any sign of infection. Recently, the FDA issued an alert regarding a possible relationship between Cellcept and a serious neurological disease called multifocal leukoencephalopathy PML. A similar warning was issued regarding the drug rituximab Rituxan in late PML is an extremely rare but fatal disease, but it is important to understand that Cellcept and rituximab are not unique in their linkage to PML. PML is associated with conditions of severe immune deficiency, such as AIDS, cancer, lupus, and the immunosuppression that can be involved in the treatment of those conditions. Although immunosuppressive medications are effective in the treatment of lupus, your doctor can discuss with you the risk of this possible relationship and the use of the immunosuppressive medications involved in your advised treatment. It is now also prescribed for people who suffer from inflammation of the kidney caused by lupus, otherwise known as lupus nephritis. Cyclosporine is also prescribed for people with severe psoriasis, a skin condition that can also cause pain and swelling of the joints, and it can be helpful in reducing some of the pain, swelling, and stiffness associated with lupus arthritis. The starting dose of cyclosporine depends on your body weight usually 2. The dose is then increased depending on how well the medication works for you and

how well your body tolerates the drug. Cyclosporine comes in 25 and mg tablets, and patients usually end up taking 75 or mg per day. You may notice some reduction in pain and swelling after about a week of taking the medication, but its full effects are usually not felt for about 3 months. Cyclosporine can cause some side effects. In addition, because cyclosporine can be tough on the kidneys, it can cause a substance called uric acid to build up in the blood a state known as hyperuricemia. Sometimes this buildup of uric acid can cause gout, a condition that causes intense swelling in one of the joints, often the the big toe. If you already have gout, your condition may worsen while taking cyclosporine. Fortunately, many of these side effects go away as treatment with cyclosporine is reduced or stopped, so your doctor can work with you to adjust your dosage if you begin to experience these problems. Other common side effects include headaches, stomach pain including dyspepsia, a gnawing or burning pain in the pit of your stomach accompanied by bloating , vomiting, diarrhea, and swelling in your hands or feet. Less common side effects include tremors unintentional muscle movements , increased hair growth, muscle cramps, and numbness or tingling in your hands and feet a condition known as neuropathy. Some people may also experience swelling of the gums while taking cyclosporine. Be sure to brush and floss regularly; this routine may alleviate some of this swelling. Cyclosporine may increase your risk of developing certain types of cancer, including skin cancer. For this reason, you should coordinate regular skin exams with your doctor. In addition, try to stay out of the sun and make sure to wear sunscreen when you do go outside. Do not eat grapefruit or drink grapefruit juice while taking cyclosporine. Grapefruit increases the amount of cyclosporine that is absorbed by your body. Like other immunosuppressive medications, cyclosporine increases your risk of infection, so make sure to wash your hands and stay away from people who may be sick. Notify your doctor at the first sign of any illness. In addition, tell your doctor if you plan to have any vaccines or surgeries, since both can pose risks for people taking immunosuppressive medications. Cyclosporine can cause serious complications during pregnancy such premature labor and high blood pressure and fluid retention in your baby, so you should not take cyclosporine if you are pregnant or may become pregnant. Also, do not take cyclosporine while breast-feeding, since it can be passed to your baby through breast milk. Cyclosporine interacts with certain drugs, so be sure to notify your doctor of any medications you may be taking, including prescription and over-the-counter drugs, supplements, and vitamins.

2: Safety of RA drug treatments in pregnant and nursing women

Disease-modifying antirheumatic drugs (DMARDs) are a group of medications commonly used in patients with rheumatoid arthritis. Some of these drugs are also used in treating other conditions such as ankylosing spondylitis, psoriatic arthritis, and systemic lupus erythematosus.

It has a relatively rapid onset of action at therapeutic doses weeks , good efficacy, favorable toxicity profile, ease of administration, and relatively low cost. When looking at groups of patients on different DMARDS, the majority of patients continue to take Methotrexate after 5 years, far more than other therapies reflecting both its efficacy and tolerability. Methotrexate is effective in reducing the signs and symptoms of RA, as well as slowing or halting radiographic damage. It was as effective as leflunomide and sulfasalazine in one study, and its effectiveness given early and in higher doses approached the efficacy of etanercept and adalimumab as single therapies in terms of signs and symptom improvement. Methotrexate is also effective in many other forms of inflammatory arthritis including psoriatic arthritis and other spondyloarthopathies, and is used in many other autoimmune diseases. The immunosuppressive and toxic effects of methotrexate are due to the inhibition of an enzyme involved in the metabolism of folic acid, dihydrofolate reductase. Dosing typically begins at Maximal dose is usually 25 mg per week but is sometimes increased further to 30 mg. Methotrexate can be given orally or by subcutaneous injection. The latter route of administration can be advantageous for patients who have methotrexate-associated nausea. Patients starting methotrexate should be carefully evaluated for renal insufficiency, acute or chronic liver disease, significant alcohol intake or alcohol abuse, leukopenia low white blood cell counts , thrombocytopenia low platelet counts , or untreated folate deficiency. Obesity, diabetes and history of hepatitis B or C are factors that have been suggested but not confirmed to increase methotrexate hepatotoxicity liver injury. If alternatives exist, concomitant use of methotrexate and trimethoprim is to be avoided. The coadministration of NSAIDS with methotrexate is routine in patients with rheumatoid arthritis and is considered safe by rheumatologists as long as liver function tests and blood counts are closely monitored. Usual Time to Effect: The onset of action is seen in as early as 4 to 6 weeks. However the dose required to achieve a response is variable in individual patients and may require weeks after a dose increase to determine if the drug is working. A trial of 3 to 6 months at an increased dose e. In patients with partial responses to methotrexate, additional medications are usually added to rather than substituted for methotrexate to achieve combination therapies. Fortunately the most serious complications of methotrexate therapy: Stomatitis and oral ulcers, mild alopecia and hair thinning, and GI upset may occur and are related to folic acid antagonism. These side effects can be improved with folic acid supplementation. Folic acid given at a dose of 1mg daily does not diminish the efficacy of methotrexate and is routinely given with methotrexate to decrease these side effects. Some patients complain of GI upset nausea or diarrhea with oral methotrexate. This may be lessened when methotrexate is taken at night. In most cases this is completely eliminated when methotrexate is given by subcutaneous administration. Before starting methotrexate, baseline studies should include complete blood count, liver chemistries, serum creatinine, hepatitis B and C serologies, and chest X-ray. Routine toxicity monitoring should include a CBC, liver profile, serum albumin and serum creatinine every weeks. In all clinical trials combining methotrexate with one of these DMARDs, no unexpected toxicities or synergistic toxicities were observed with the exception of higher liver toxicity with leflunomide which is also metabolized by the liver. Hepatotoxicity liver injury has not been significant if patients with pre-existing liver disease, alcohol abuse, or hepatic dysfunction are excluded from treatment with methotrexate. Patients are instructed to limit alcohol containing beverages to no more than one-two per week. Baseline or surveillance liver biopsies are not indicated unless pre-existing liver disease is suspected. Elevated liver enzymes do not directly correlate with toxicity but therapy should be stopped and doses of methotrexate reduced if transaminases are elevated to 2 times the upper limit of normal. Liver biopsy should be done if elevated liver enzymes persist or if methotrexate therapy is to be continued. Methotrexate pneumonitis may occur at any time during therapy and is not dose related. A baseline chest x-ray is useful for comparison. Patients with poor pulmonary reserve from other causes may be excluded from therapy over concerns of

increased morbidity if methotrexate pneumonitis occurs. A more chronic form of interstitial lung disease and fibrosis is also seen in patients with rheumatoid arthritis. This may be increased with methotrexate. Myelosuppression lowering of blood counts is also rare at the low doses of methotrexate utilized for rheumatoid arthritis. In the absence of leukopenia lowered white blood cell counts , there has not been conclusive information to link methotrexate use in rheumatoid arthritis with increased risk of infection. The exception is a slight increased risk of localized herpes zoster infection shingles. Cancer risk with methotrexate. Although there are case reports of lymphoma associated with methotrexate therapy including cases where the lymphoma resolved after cessation of therapy, increased occurrence of malignancy has not been found in large population-based studies. It is important to recognize that patient with rheumatoid arthritis have an increased risk of developing lymphoma as a consequence of their autoimmune disease, independently from any potential medication effects. Pregnancy and Conception with methotrexate. There have not been any notable effects on sperm production or ovarian function after the prolonged administration of methotrexate. However, methotrexate is considered a teratogen; therefore, women of childbearing potential or men with partners of childbearing potential must practice effective birth control. Women should discontinue methotrexate for at least one ovulatory cycle prior to attempting conception, while men should wait 3 months. Hydroxychloroquine Hydroxychloroquine is an antimalarial drug which is relatively safe and well-tolerated agent for the treatment of rheumatoid arthritis. Chloroquine is another antimalarial agent that is also sometimes used. The mechanism of action of antimalarials in the treatment of patients with rheumatoid arthritis is unknown but is thought to involve changes in antigen presentation or effects on the innate immune system. Chloroquine is not commonly used because of greater toxicity on the eye. It may be prescribed as a single daily dose or in divided doses twice per day. A period of 2 to 4 months is usual. The most important toxicities are on the eyes: Ocular toxicity is exceedingly rare, occurring in only 1 out of 40, patients treated at the doses recommended. Patients with underlying retinopathies or risks may not be good candidates for antimalarial drugs. Baseline ophthalmologic examination and a follow-up examination every 12 months are recommended during the period of treatment. Its effectiveness overall is somewhat less than that methotrexate, but it has been shown to reduce signs and symptoms and slow radiographic damage. Sulfasalazine is also used in the treatment of inflammatory bowel disease and spondyloarthropathies. Its mechanism of action in RA is unknown. Some of its effects may be due to folate depletion. The usual dose is grams per day in a twice daily dosing regimen. The dose may be initiated at 1 gram per day and increased as tolerated. It may take 6 weeks to 3 months to see the effects of sulfasalazine. Sulfasalazine may cause hypersensitivity and allergic reactions in patients who have experienced reactions to sulfa medications. Mild gastrointestinal complaints are commonly seen and these can be decreased by using enteric coated formulations or administration of the medication with meals. Occasionally, mild cytopenias are seen. Patients may be screened before the use of sulfasalazine for a deficiency of the enzyme glucosephosphate dehydrogenase G6PD which may predispose patients to red blood cell hemolysis and anemia. Blood monitoring is typically every months depending on dose. Though sulfasalazine may cause increases in liver function tests, it is generally considered a preferable agent to methotrexate in patients with liver disease or in patients who have hepatitis B or C. Its efficacy is similar to methotrexate in terms of signs and symptoms, and is a viable alternative to patients who have failed or are intolerant to methotrexate. Leflunomide has been demonstrated to slow radiographic progression. Studies have demonstrated that it can also be carefully combined with methotrexate in patients with no preexisting liver disease, as long as the liver function tests are carefully monitored. Leflunomide has also been studied in psoriatic arthritis with some efficacy demonstrated. The mechanism of action of leflunomide is not fully understood but may be related to its ability to inhibit de novo pyrimidine biosynthesis through the inhibition of the enzyme dihydroorotate dehydrogenase. Laboratory studies have demonstrated that it also has effects on stimulated T cells. The half-life of the active metabolite of leflunomide is very long. Leflunomide and its metabolites are extensively protein bound and undergo further metabolism before excretion. When initially approved, the medication was given using a loading dose of mg daily for three days then followed by 20 mg daily. The dose may be reduced to 10mg daily if not tolerated at the 20 mg dose. The onset of action is relatively rapid within weeks. The onset of action of Arava may be seen earlier than methotrexate when using

a loading dose. Leflunomide has been associated with liver transaminase elevations that reversed with cessation of the drug in clinical trials. Routine monitoring should include complete blood count and hepatic panel more frequently at the beginning of therapy then on a regular basis at least every 2 months. Other toxicities that are common include mild diarrhea, GI upset and alopecia and hair thinning sometimes of sufficient severity to cause cessation of the drug. Because leflunomide and its metabolites are a teratogen, extreme care must be taken for treatment of women of child bearing potential. Women must be warned about the possible risk to the fetus and cautioned to use adequate birth control. Women wishing to become pregnant must take cholestyramine 8gm 3 times daily for 11 days and then have two leflunomide metabolite levels drawn 14 days apart to document serum concentration less than 0. Leflunomide treatment does not appear to be associated with an increased risk for infection. Tumor necrosis factor TNF inhibitors Tumor necrosis factor alpha TNF is a pro-inflammatory cytokine produced by macrophages and lymphocytes. It is found in large quantities in the rheumatoid joint and is produced locally in the joint by synovial macrophages and lymphocytes infiltrating the joint synovium. TNF is one of the critical cytokines that mediate joint damage and destruction due to its activities on many cells in the joint as well as effects on other organs and body systems. These drugs began to enter the market for rheumatoid arthritis in and are now considered a part the ACR recommendations for treatment of RA. Etanercept if a soluble TNF receptor-Fc immunoglobulin fusion construct; infliximab, adalimumab, and golimumab are monoclonal antibodies; and certolizumab pegol is an anti-TNF antigen binding domain-polyethylene glycol construct. While differing in structure, the efficacy and safety of the drugs is similar across the class in reducing the signs and symptoms of RA, as well as in slowing or halting radiographic damage, when used either as monotherapy or in combination with methotrexate. TNF inhibitors have a rapid onset of action sometimes with improvements seen within 2 to 4 weeks. However, additional improvements can be seen over months.

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3: Immunizations in Adults Taking Disease-Modifying Antirheumatic Drugs

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This medication acts as an anti-inflammatory drug, which is one of the most frequently used immunosuppressants. This is mostly used for severe disease. This medicine starts working within three to six weeks, but the complete effect of this medicine is not present until after 12 weeks of treatment. This medicine should be used in conjunction with another medication; however, if it is used alone, then it loses its effectiveness. Methotrexate can be used in combination with other medications, such as hydroxychloroquine, leflunomide, or sulfasalazine. This medication can also be combined with various biological response modifier drugs, which have been used for the treatment of patients with early aggressive arthritis. This combination of drugs works better than the single therapy. Mostly, it is seen that almost 20 percent of the patients taking this drug withdraw due to its side effects. Those side effects would include nausea , vomiting, headache, loss of hair , and pain in the muscles. Methotrexate is also known to reduce the level of folic acid in the body, and this is also harmful and can lead to certain other side effects. Hence, in certain cases the doctors can also prescribe supplements of folic acid to avoid any side effects. However, some say that by doing so, the effectiveness of methotrexate gets reduced. This medicine is usually given in pills; however, those patients who need higher doses would need to go for the option of injection. There are a few severe side effects that can be toxic, which may include: Hence, patients should limit the intake of alcohol. There are increases in the chances of getting infections, so this medicine should not be given to patients who are already suffering from herpes zoster virus, any kind of bacterial infection, active or latent case of tuberculosis , or hepatitis B , acute or chronic. Those individuals who have poor functioning of the lungs are at higher risk of getting lung disease. Pregnant women should not be given this medicine, unless consulting with the doctor, since it can lead to birth defects. Infliximab was the first chimeric monoclonal antibody that was used to treat rheumatoid arthritis. When a person has rheumatoid arthritis, then due to the symptoms of inflammation, too much of a protein called TNF is produced by the body. This leads to pain, inflammation, and harm of the bones and joints. One cannot term them as painkillers, but they have the ability to modify the disease so that the symptoms start to improve. This would gradually take around two to twelve weeks of time. Infliximab will not be prescribed if the arthritis is not active, if one is suffering from any kind of infection, or if one has multiple sclerosis , cancer, conditions related to heart, or lung fibrosis. Infliximab is given to the person via a drip into the arm or intravenous infusion. This process takes around two hours and needs to be done in the hospital. The doctor would then check for any signs of side effects; hence, the person is asked to wait for one or two hours. Post the first infusion, the patient would have another infusion two weeks later, and then the third one would be four weeks later. Once this third one is done, the person would need to have one infusion done every eight weeks. Later, this can be done at home and would take less time. The symptoms would start showing improvement from the second week, and in some cases, it would be 12 weeks for the symptoms to go away. This is a long term treatment; hence, one should ensure to complete the entire dose, unless there are any side effects. Golimumab is an anti-TNF medication that helps to block the TNF, which in turn reduces the inflammation condition in the patients. One should not treat them as painkillers, but they can start showing some improvement in the symptoms, which would take around 12 to 14 weeks. This would mean improvement could be seen after three to four doses. Golimumab will not be prescribed if the arthritis is not active, if one is suffering from any kind of infection, or if one has multiple sclerosis, cancer, a condition related to heart, or lung fibrosis. Golimumab is given to the patient once per month via injections under the skin. This can be injected into the thigh, upper arm, or stomach. This medicine comes in a 50 mg syringe or pen-like device. If one forgets to take this dose, then you can take it as soon as you remember. If this medicine has been delayed for more than two weeks, then one would need to start a new schedule from the date one has taken the delayed dose. Always remember to never inject oneself with a double dose to make up for the missed dose. It would take around 12 to 14 weeks for the symptoms to show some signs of improvement. This is a long term treatment; hence, it is

important to complete the entire dose, unless there are any side effects. Side effects of this medicine would be reactions to the injections, such as swelling, pain, or redness at the injection site. These effects are nothing to worry about and are quite common. Since Golimumab impacts the immune system, there are chances a person may develop infections. Some symptoms of infections are sore throat and fever, which should be noted to the doctor. Tocilizumab is a type of drug that falls under the category of biological therapy. There is excess protein called IL-6, which gets produced in the body due to certain conditions. This then leads to symptoms such as anemia, feeling of tiredness, or damage to the bones and joints. Tocilizumab blocks this action caused by IL-6, thereby reducing its effects. One cannot call it a painkiller; it can only reduce the symptoms of the disease. One can start noticing changes in the symptoms from the second week to the 12th week post starting the medication. Tocilizumab is usually prescribed by the doctor along with another combination of methotrexate. The doctor may prescribe Tocilizumab if there is any existing infection or the arthritis is not active. If the person is suffering from diabetes , liver disease, or intestinal ulcers, this medicine would not be prescribed. There are two ways the doctor can give Tocilizumab. It can be in the form of a drip into the vein, which can take around an hour and has to be done once every four weeks. The other way is via injection once a week. Later on, this can be given at home by any family member. This is again a long term treatment and has to be completed, unless one experiences any side effects. It helps to reduce the defense mechanism of the body, which in certain conditions can be overactive. Azathioprine is known to modify the underlying process of the disease so that it limits further damage to the tissues and avoids any kind of disability. This is a long term treatment, and it would take around six to twelve weeks for the symptoms to start showing some improvement. If one is suffering from liver or kidney problems, or has problems with bone marrow, then Azathioprine needs to be used with caution. Inform the doctor of the same. Azathioprine is available in tablet form and should be taken once or twice in a day. It can be taken with or without food. Initially, the doctor would prefer to start on a lower dose and gradually increase it, depending on any side effects of the same. Azathioprine is known to cause certain serious GI problems; patients may experience nausea, vomiting, or pain in the stomach. In serious conditions, it can lead to reduction in the white blood cells. Etanercept is an anti-TNF drug. When there is too much of protein called TNF produced by the body, it leads to inflammation, pain, and damage to the bones and joints. This is the first drug that was used for the treatment of rheumatoid arthritis. Etanercept can modify the symptoms caused by the disease. It is not a painkiller, nor can it cure the disease. The symptoms start showing improvement by the second week. The doctor may not prescribe Etanercept if the patient is suffering from severe forms of infection, has cancer, or has lung fibrosis. Etanercept can be taken once or twice in a week as an injection. Previously, this medication was available under the brand name Enbrel; later, a new version was developed with the brand name Benepali. This is referred to as a bio-similar. The possible side effects of Etanercept are nausea, mild fever, runny nose, rash, or pain in the stomach. This is again an anti-TNF medication. Hence, it blocks the production of TNF, which reduces the effects of inflammation in the body. Adalimumab can modify the symptoms caused by the disease. The doctor may not prescribe this medicine if the patient is suffering from severe forms of infection, has cancer, or has lung fibrosis. Adalimumab is given by way of injection once every two weeks in the dosage of 40mg. This is a long term treatment, and hence, it is important to complete the entire course, unless there are any side effects. The injections side effects, such as redness, swelling, or pain, would subside gradually. Since Adalimumab has an impact on the immune system, it can tend to cause some serious infections. Hence, inform the doctor if you notice any symptoms, such as fever, diarrhea, or coughing. This is known to show promising results for children. Anakinra is available under the brand name Kineret. This drug was approved in This medication can be used either alone or with another medicine. This helps to slow down the damage caused to the joints and also to reduce the pain and swelling caused by the disease. Anakinra is a man-made form of protein. This is similar to other drugs, which help to block the effects of protein, which in turn leads to less inflammation in the joints.

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4: Disease-modifying antirheumatic drug - Wikipedia

Disease-modifying antirheumatic drugs, better known as "DMARDs," are immunosuppressive medications that are used to treat the pain and swelling of the arthritis that can accompany lupus. DMARDs not only reduce this pain and swelling, but they may also be able to decrease long term damage to your joints.

Other Immunosuppressant Drugs Mycophenolate mofetil CellCept acts by inhibiting a de novo pathway of purine synthesis in lymphocytes, leading to intracellular depletion of guanosine monophosphate. This results in the suppression of cytotoxic T cells and the formation of antibodies by activated B cells. A dose of mg twice a day in 2 divided doses is well tolerated by patients and can be used to reduce the steroid dose Panes J et al, Panes J, Gomollon F, et al. Optimizing therapy for inflammatory bowel disease. Dec ;92 12 suppl: The use of IL ilodecakin resulted in a trend toward clinical improvement but not remission in chronic active Crohn disease, and IL oprelvekin was found to be effective in inducing remission in a preliminary study in patients with mild to moderate Crohn disease Panes J et al, Panes J, Gomollon F, et al. Side Effects The principal adverse reactions associated with the administration of Mycophenolate mofetil CellCept include diarrhea, leukopenia - loss of white blood cells that can be fatal , sepsis i. Other possible side effects include gastrointestinal bleeding, disorders of the nervous system, fetal harm in pregnant women. Lymphoproliferative disease or lymphoma blood cancer were developed in 0. Tocilizumab Actemra is a monoclonal antibody to the IL The drug has been approved in by the FDA for the treatment of rheumatoid arthritis and had been approved before in Japan and Europe. Tocilizumab has been approved for use in adults with moderate to severely active rheumatoid athritis who have not responded to one or more anti alpha TNF therapies. It has been suggested to have a beneficial clinical effect in Crohn disease Matsuyama M et al, Matsuyama M, Suzuki, et al. It has not been studied, and should not be used, in combination with other biologic DMARDs because of the possibility of increased toxicity. Serious and sometimes fatal infections due to bacterial, mycobacterial, invasive fungal, viral and protozoal and other opportunistic pathogens have occurred in patients receiving tocilizumab, and a black box warning is included in the label. Due to its severe side effects, prescribers must be registered in a particular program. For the same reason, it should only be used in moderate to severe cases of the disease and when other treatments were ineffective or could not be tolerated. Natalizumab is a humanized monoclonal antibody against the cellular adhesion molecule alpha4-integrin. It reduces the ability of inflammatory immune cells to attach to and pass through the intestinal epithelial cells. Natalizumab is given by infusion. Other serious side effects of natalizumab include allergic reactions, and increased susceptibility to infections including serious herpes infections. Natalizumab should not generally be used in patients who are currently taking immunosuppressant drugs. Natalizumab may also cause liver injury within a week of starting the drug. Other less serious side effects may include headache, fatigue, urinary tract infections, joint and limb pain, rash, and infusion reactions. Adverse Reactions Preferred Term.

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5: Leflunomide - Wikipedia

Rheumatoid arthritis treatment includes medications that slow the progression of joint damage from rheumatoid arthritis. These drugs are called disease-modifying antirheumatic drugs (DMARDs), and.

Antimalarials Antimalarial treatment, commonly used with success in rheumatoid arthritis, has sometimes been used to treat psoriatic arthritis. Antimalarials are usually given as one or two pills, once a day. It may take many months before seeing benefits. Side effects include vision changes blurring, halos around lights and sensitivity to light , headache, dizziness, nausea and vomiting. Individuals taking an antimalarial should have eye examinations periodically. Unless you are directed to do so by your doctor, do not take Plaquenil, the most commonly prescribed antimalarial. The use of Plaquenil may cause a severe flare of psoriasis. Some antimalarials can cause the skin disease to get worse in some individuals. Talk to your doctor about the available antimalarial treatments and alternatives. Corticosteroids Steroid medications taken by mouth or injection are not generally recommended for long-term treatment of psoriatic arthritis. In some circumstances, they may be needed for relief of acute, severe joint inflammation and swelling. For the most part, large doses of steroids should be avoided. Psoriasis lesions may potentially become worse after the steroid treatment is discontinued. Severe forms of psoriasis, such as pustular psoriasis, may occasionally be provoked by the use of systemic steroids. However, selective low-dose steroid injections to inflamed joints, tendons and the area around joints can improve range of motion. Acthar Another therapy that may be used for relief of acute, severe joint inflammation and swelling is Acthar, a corticotropin that may help your body produce its own natural steroid hormones which help your body regulate inflammation. Acthar is injected beneath the skin or into the muscle for short-term treatment as prescribed by your provider. Imuran Imuran is an immunosuppressive drug approved for use in arthritis. It has potent anti-inflammatory effects. Skin lesions may respond to the treatment as well. Blood tests must be performed periodically. Leflunomide Leflunomide brand name Arava is a rheumatoid arthritis drug that has been prescribed off-label for the treatment of psoriatic arthritis. Leflunomide, which comes in a pill, is beneficial to some people with psoriatic arthritis, according to recent medical studies. Methotrexate Methotrexate , an immunosuppressive drug, is FDA-approved for treating psoriasis, and is used widely and successfully for treating psoriatic arthritis and rheumatoid arthritis. It can be effective at relieving the symptoms associated with psoriatic arthritis, and it may help prevent joint destruction. Methotrexate usually is well tolerated in low doses. However, it potentially has a number of side effects and the long-term potential of damaging the liver. With careful management and dosage, the drug can be used safely for years by certain individuals. Sulfasalazine Sulfasalazine, a sulfa drug developed to treat inflammatory bowel diseases, is sometimes used for psoriatic arthritis. Approximately one-third of psoriatic arthritis patients respond rapidly to this treatment usually within four to eight weeks. Sulfasalazine is given in doses of 4 tablets twice a day. Use of sulfasalazine is not recommended in patients with sulfa allergies, people with intestinal or urinary obstructions and individuals suffering from porphyria, a metabolism disease. A doctor may require regular blood tests while a patient is on sulfasalazine to monitor cell counts and liver enzymes. Possible side effects include nausea, rash, headache, abdominal pain, vomiting, fever and dizziness. They are highly selective agents that target specific internal events in the body that cause psoriasis and psoriatic arthritis. It is important to work closely with your rheumatologist or other health care provider. Each case of psoriatic arthritis must be evaluated individually.

DMARDS AND IMMUNOSUPPRESSIVE DRUGS. pdf

6: DMARDs (Disease-Modifying Antirheumatic Drugs) Overview | Treatments | www.enganchecubano.com

Disease-modifying antirheumatic drugs (DMARDs) are used to decrease inflammation. Unlike other medications that temporarily ease pain and inflammation, DMARDs can slow the progression of RA.

Understand these treatments for inflammatory arthritis. Advertisement Advertisement People with inflammatory arthritis are living full active lives thanks to disease-modifying antirheumatic drugs, or DMARDs. DMARDs help preserve joints by blocking inflammation. Without DMARDs, inflammation would slowly destroy joint tissue over the years to the point where the joint would become misshapen and unusable. Biologics are potent and can be expensive, so your doctor may not start you on them right away. Your doctor will take a baseline x-ray and blood tests before starting you on any of the DMARDs so your disease and any potential drug side effects can be monitored over time. DMARDs are not pain medication. They will eventually help your pain because the inflammation and joint tenderness will lessen, but a couple of months may pass before their anti-inflammatory benefits kick in. Tell your doctor if you have any side effects, such as nausea, vomiting or hair loss; if urination is painful; or if you are sick with a fever, chills or a sore throat. A list and brief description of traditional and targeted DMARDs can be found below, but the four most commonly used are methotrexate, hydroxychloroquine, sulfasalazine and leflunomide. Most of the drugs listed below are approved for rheumatoid arthritis; some are also approved for ankylosing spondylitis, psoriatic arthritis, juvenile idiopathic arthritis or lupus. Often, these drugs are used in combination, usually with methotrexate as the base. Comes in tablet only; used most commonly in lupus. This drug depends on a specific enzyme to work and some people lack enough of this enzyme to make the drug effective. Your doctor will test your levels before prescribing azathioprine. Comes in capsule, tablet or infusion. Can be used in lupus in patients who do not respond to traditional therapy or who experience kidney damage. Cyclosporine Neoral, Gengraf, Sandimmune, generic: Comes in capsule or syrup. This medicine is used sometimes for lupus in people who do not respond to other therapies. Hydroxychloroquine sulfate Plaquenil, generic: Comes in tablet only. Antimalarial drugs are commonly used to treat rheumatoid arthritis and can help improve the skin lesions of lupus, and can hold off disease recurrence and prevent organ damage. Serious side effects for antimalarial drugs are rare. Comes as a pill taken once a day. People who cannot tolerate methotrexate may take leflunomide. It can also be taken in combination with methotrexate. Methotrexate Rheumatrex, Trexall, Otrexup, Rasuvo, generic: This drug is taken once a week and comes in tablet or as a self-injectable. It is for adults with active RA and children with active juvenile idiopathic arthritis with more than one affected joint. Mycophenolate mofetil CellCept, generic: Comes in tablet, capsule and as a self-injectable. This drug may be used in people whose RA does not respond to other therapies. Sulfasalazine Azulfidine, Sulfazine, generic: Comes in regular or extended-release tablets. This drug is most commonly used in a triple therapy combination for RA methotrexate, sulfasalazine, hydroxychloroquine. Approved for use in people with psoriatic arthritis. Comes in immediate or extended-release tablets. Approved for use in people with rheumatoid arthritis Advertisement.

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7: DMARDs and immunosuppressive drugs - Oxford Medicine

People with inflammatory arthritis are living full active lives thanks to disease-modifying antirheumatic drugs, or DMARDs. If you've been diagnosed with rheumatoid arthritis, ankylosing spondylitis, psoriatic arthritis, juvenile idiopathic arthritis or lupus, you will likely end up taking at.

Use this information to help discuss medication choices with your doctor. Because inflammatory arthritis is a chronic condition, most people with rheumatoid arthritis RA , psoriatic arthritis PsA or juvenile idiopathic arthritis JIA will take disease-modifying antirheumatic drugs DMARDs for the long run. Each DMARD works differently on the immune system, but they all preserve joints by reducing chronic inflammation. The four most commonly used traditional DMARDs are hydroxychloroquine, sulfasalazine, leflunomide and methotrexate, with methotrexate being the most popular. Because DMARDs suppress your immune system to stop rampant inflammation, all of them will increase your risk of infection. If you have signs of infection â€" chills, fever, sore throat, painful urination, for example â€" report them to your doctor immediately. They also make receiving live vaccines dangerous. Use extra care to avoid infection and discuss vaccines with your doctor. DMARDs do not provide immediate relief. Although there are no cookie-cutter recipes for everyone with inflammatory arthritis, these are relatively safe medications. This listing will give you an overview, but be sure to talk over any concerns with your doctor. This drug suppresses the immune system to treat inflammation in autoimmune conditions including dermatomyositis, lupus, inflammatory bowel disease and vasculitis. It also is sometimes used to treat rheumatoid arthritis, but not as often as methotrexate. The most common side effects of azathioprine include nausea, vomiting and diarrhea. Liver and pancreas damage are less common, but can occur. Cyclophosphamide is reserved for severe rheumatoid arthritis that has not responded to other treatments. It also is used for complications of lupus, myositis, scleroderma or vasculitis. Cyclophosphamide can have serious side effects, including reduced blood cell counts, fertility problems, birth defects, bladder trouble and heightened cancer risk. If you take this medicine, you will have to be carefully monitored by your doctor. Cyclosporine is a potent immunosuppressant drug that decreases the pain and inflammation of arthritis, prevents joint damage, and slows the progression of inflammatory arthritis over time. Cyclosporine use requires frequent laboratory testing and has many drug interactions. The most common and serious side effects are high blood pressure and kidney problems. Hydroxychloroquine is a relatively safe medicine that is used to treat mild rheumatoid arthritis. It can be used in combination with other drugs to treat more severe cases. It is also used for complications of lupus. Hydroxychloroquine has few side effects, but nausea and diarrhea may occur when you first start taking the drug. In very rare cases, vision loss has happened. You will have to see an eye doctor once a year for screening. Leflunomide is used to treat moderate to severe rheumatoid arthritis, often when methotrexate is not controlling symptoms. It is usually given alone, not in combination. Leflunomide is sometimes used to treat psoriatic arthritis. This drug most commonly causes nausea and diarrhea. It can also cause hair loss. It clears from the body slowly; a wash-out procedure may be needed before trying to get pregnant. This is the most commonly prescribed drug for rheumatoid arthritis and one of the most effective for several kinds of inflammatory arthritis. Methotrexate most commonly causes nausea. Women who want to become pregnant should not take methotrexate. Methotrexate can cause an increase in liver enzymes and is therefore not recommended for those who drink alcohol. This drug is used for people with rheumatoid arthritis or vasculitis, or for people with lupus who have kidney disease. It is a potent suppressor of the immune system. Some of the most common side effects of mycophenolate mofetil are upset stomach, nausea and diarrhea. Taking antacids may decrease its effectiveness. Women of childbearing age should use an effective form of birth control at least 4 weeks before, during and 6 weeks after treatment. This drug is used for people with rheumatoid arthritis and other autoimmune conditions. Sulfasalazine can lessen pain and swelling and slow the progression of arthritis. Sulfasalazine may cause nausea and vomiting. It can cause yellow-orange urine or skin. It is generally safe for pregnancy, but should not be taken while breastfeeding. This drug may lower sperm count in men, an effect that gets better once the drug is stopped. Apremilast is one of the newest treatments for adults with psoriatic

arthritis. Nausea and diarrhea are common side effects. It has been associated with new or worsening depression, suicidal thoughts and other mood changes. Tell your doctor if you have unexplained weight loss. This drug is used for adults with moderate to severe rheumatoid arthritis whose disease has not responded to methotrexate. Your cholesterol levels will need to be monitored. The most common side effects are upper respiratory tract infections, diarrhea, headache, nasal congestion, sore throat and runny nose. This drug should also not be used if you have liver problems.

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8: Antirheumatic Drugs and the Risk of Tuberculosis | Clinical Infectious Diseases | Oxford Academic

These immunosuppressive antirheumatic drugs are being directly marketed to patients with a frequency on a par with statins and ED medications. One cannot open a magazine or watch a program that does not advertise some drug in this category.

Advanced Search Abstract Background. We aimed to quantify the rate of Mycobacterium tuberculosis disease TB among a cohort of patients with rheumatoid arthritis RA and to assess whether the independent use of disease-modifying antirheumatic drugs DMARDs is associated with the risk of developing TB. Conditional logistic regression was used in a nested case-control analysis to estimate the rate ratio RR of TB with any use of biological or traditional DMARDs during the year before the index date. The cohort consisted of , patients with RA. A total of cases of TB were identified, which resulted in an overall rate of 2. RRs of developing TB disease with the use of biological or traditional DMARD were lower among current users of corticosteroids than among noncurrent users of corticosteroids. We found that the use of biological and traditional DMARDs is associated with an increased risk of developing TB in patients with RA, mainly among noncurrent users of corticosteroids. It is generally believed that rheumatologic diseases, such as systemic lupus erythematosus and possibly rheumatoid arthritis RA , may be associated with an increased risk of Mycobacterium tuberculosis disease TB [1 , 2]. Although the rheumatologic diseases themselves have been associated with this risk increase, it is suspected that immunosuppressant therapies used to treat RA may also increase the risk of TB. According to reported case-series and surveillance systems, the use of these biological diseaseâ€”modifying antirheumatic drugs DMARDs may be associated with an increase in the risk of developing active TB, compared with that of the general population [2 , 4â€”6]. The magnitude of the increase in TB risk that is associated with either of these agents, as well as with the human IL-1 receptor antagonist anakinra another biological DMARD , is unknown. In addition, it is unclear whether this effect is modified by other antirheumatic drugs. Methods Study design and data source. Patient privacy is protected through encryption algorithms that are performed by each contributing organization. The subjects entered the cohort on the date that the first prescription for an anti-RA drug was dispensed after a year of eligibility in a health insurance plan. They were observed until the earliest of the date of termination of enrollment in the health plan, the date of death, the end of the study period 31 December , or the date of the outcome of interest namely TB. Subjects who had TB prior to cohort entry were excluded. Nested case-control study design. We used a nested case-control study design within the RA cohort, an efficient approach to address the complex patterns of drug exposure over time with insignificant loss of power [7]. For each case of TB, we randomly selected control subjects from the cohort after matching for the date of cohort entry and ensuring that control subjects were at risk on the day that the case occurred. This date was designated as the index date. All drugs received during the observation period were identified from dispensed prescription data. The type, date of filling, and quantity of each prescription were obtained from the database. For purpose of comparisons, we considered exposure to anti-RA drugs in the year prior to the index date. Adalimumab, another TNF inhibitor, was introduced in , and was therefore not part of our study. Age and sex were used as covariates to define the study sample. The assessments of the comorbid clinical conditions known to increase the risk of TBâ€”diabetes ICD-9, Other drugs commonly used as concomitant treatment for rheumatoid arthritisâ€”namely, the non-DMARDS such as nonsteroidal anti-inflammatory drugs NSAIDs , corticosteroids, and cyclyoxygenase-2 COX-2 inhibitorsâ€”were used as covariates to adjust for disease severity. For corticosteroids and COX-2 inhibitors, current exposure was defined by prescriptions dispensed in the day period prior to the index date. Total person-years of follow-up were used to estimate the overall rate of occurrence of TB for the entire cohort. Conditional logistic regression was used in the nested case-control analysis to estimate the rate ratio RR of TB for any use of biological or traditional DMARDs during the year before the index date. As corticosteroids are a known risk factor for the development of TB, we assessed the interaction between DMARDs and the current use of corticosteroids. There were cases of TB identified during the follow-up period, for an overall rate of 2. For those exposed to TNF blocking agents the rate was 2. The median time from the first prescription until

presentation of TB for those patients who received infliximab was 17 weeks range, 1â€”71 weeks ; for those who received etanercept, 79 weeks range, 3â€” weeks ; and for those who received anakinra, 62 weeks range, 7â€” weeks. Table 1 compares the baseline characteristics of the study subjects with TB and the control subjects. Patients with TB were significantly younger than were control subjects. Case subjects showed a significantly higher rate of diabetes and other comorbid conditions and were more likely to be exposed to biological and traditional DMARDs and glucocorticosteroids during the 1-year baseline period. Table 2 shows the characteristics of control subjects according to the different exposure categories. Table 1 Baseline characteristics of case patients with tuberculosis TB and control subjects during the year prior to index date. Table 2 Baseline characteristics of 38, control subjects exposed to various classes of antirheumatic drugs during the year before index date. Table 2 View large Download slide Baseline characteristics of 38, control subjects exposed to various classes of antirheumatic drugs during the year before index date. The RR varied from 1. Among patients with TB exposed to biological DMARDs, the median number of doses prescribed in the previous year to index date was 5 range, 1â€” The differential impact of anti-RA medications by concurrent use of corticosteroids was tested by the inclusion of interaction terms. Table 5 Crude and adjusted rate ratio RR of developing tuberculosis TB associated with anti-rheumatoid arthritis RA medication use stratified by current use of corticosteroids. Discussion To our knowledge, this is the first study that attempts to clarify the independent contributions of different classes of medication to the risk of TB among patients with RA. The risk increase seen with biological DMARDs appears to be consistent for the 3 agents under studyâ€”namely, the TNF-blocking agents infliximab and etanercept and the IL-1â€”blocking agent anakinra. The extent to which patients who have RA will demonstrate an excess risk of TB will depend on the prevalence of the disease, latent TB infection, and potential risk factors in the community. Unfortunately, we could not capture other factors associated with the risk of TB disease that could influence the baseline risk of TB disease while being exposed to RA drugs; these include country of birth, socioeconomic status, a history of recent contact with an individual with TB, and the presence of TB-associated abnormalities on a chest radiograph [8]. We also did not collect any information on HIV infection status or smoking behavior [9 , 10]. Our observed incidence of TB of 2. That most of the estimates from the latter study came from pharmacovigilance data or relied on passive reports, and that they could have underestimated the true TB rate through underreporting, suggests a significant issue with adverse events reports [14]. It is difficult to accurately calculate incidence using pharmacovigilance data, because the true number of exposed patients is essentially unknown. TB incidence based on a relatively short time span could also underestimate the true incidence, especially for those drugs with a longer time to presentation of TB such as certain biological DMARDs. Another potential explanation for our observed incidence of TB that is higher than previously reported would be that our cohort of adults with RA overrepresented individuals at risk for TB. Unfortunately, we could not adjust for this potential confounder in our study. This somewhat contradicts previously reported clinical presentations in relatively small numbers of TB cases among patients with RA who are treated with specific biological DMARDs [2 , 4 , 5 ,

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9: Disease-modifying Antirheumatic Drugs (DMARDs). Patient | Patient

Disease-modifying antirheumatic drugs (DMARDs) is a category of otherwise unrelated drugs defined by their use in rheumatoid arthritis to slow down disease progression.

Rheumatoid arthritis and pregnancy: Safety of different classes of RA drugs in pregnancy For some drugs commonly used to treat RA, safety data may be lacking due to the difficulty and ethical considerations associated with testing these drugs in pregnant women. For many drugs used in RA, the risk during pregnancy varies according to the stage of pregnancy. NSAIDs and aspirin Non-steroidal anti-inflammatory drugs NSAIDS including naproxen, ibuprofen, ketoprofen , as well as low-dose aspirin and other salicylates , when given from conception to the start of the third trimester are considered to present minimal fetal risk. These drugs are pregnancy category B drugs during the first stages of pregnancy. After 30 weeks of gestation, NSAIDs and high-dose aspirin may increase the risk of a type of fetal heart problem and high-dose aspirin may increase the risk for fetal bleeding or bruising. Therefore, in the later stages of pregnancy these drugs become pregnancy category C drugs. Additionally, there is a small increased risk of miscarriage with NSAID use before 20 weeks of gestation. These drugs vary according to the concentrations they reach in the fetus. As a group, they are considered pregnancy category C drugs, with evidence of birth defects mostly cleft palate in both animal and human studies. Use of corticosteroids during pregnancy in patients with RA has been associated with increased risk of premature delivery. They should be avoided, if possible, during the first trimester, when risk for defects of the hard palate are highest. Prednisone and prednisolone are preferred in pregnant women because they are inactivated as they cross the placenta. Sulfasalazine is considered a pregnancy category B drug. There is little evidence of fetal risk with sulfasalazine, as long as the expectant mother is also taking a multivitamin with 0. If the benefits of treatment with azathioprine for instance, to maintain remission during pregnancy outweigh the risks, this drug may be continued during pregnancy. With both drugs, there is increased risk for birth defects and miscarriages. Methotrexate should be discontinued at least three months prior to becoming pregnancy and leflunomide should be avoided for two years before pregnancy. While there is evidence of risk for damage to the eye and ear, if the benefits of these drugs in controlling RA symptoms are judged to outweigh the risks, they may continue to be used during pregnancy. Since many of these agents are quite new, there is limited data to determine their safety during pregnancy. TNF-inhibitors those listed above are considered pregnancy category B drugs, with a low risk for birth defects, miscarriages, and preterm births. Because of the limited safety data available, discontinuation of TNF-inhibitor therapy is recommended at the time of conception. There is evidence that anti-TNF antibodies are not transferred to the fetus during the first trimester of pregnancy. In patients who experience RA flares during pregnancy , treatment with TNF-inhibitor therapy may be resumed, with an understanding that there may be an increased risk of birth defects and other negative outcomes. Therefore, each of these drugs is considered a pregnancy category C drug. When planning pregnancy, it is recommended that these drugs be discontinued 10 weeks before conception.

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