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HIV positive pregnancy and nutrition

Summary

Background: If an HIV-positive woman becomes pregnant, certain complementary nutritional considerations must be justified, since pregnant women with HIV have greater needs to promote a healthy outcome. This review aims to provide information on HIV and pregnancy, nutrition, and infection, and how care and environment can be improved for these HIV positive women.

PubMed	Biblio Xplora	ScienceDirect
10 results	100 results	10 results
5 included	9 included	6 included
excluded	excluded	excluded
- 3 By title	- 50 By title	- 2 By title
- 1 Per abstract	- 40 Per abstract	- 2 Per abstract
- 1 Restricted	- 1 Restricted	- 2 Restricted
-	-	-

Inclusion criteria	Exclusion criteria
- Articles in Spanish and English	- Articles in Spanish and English
- Studies from 2000-2020	- Studies from 2000-2020

Results: The search yielded a total of 120 articles, of which 102 were excluded by title, abstract, or year of publication. In total, as a result of this search, 20 articles were included, which met at least one of the criteria. Based on the results of the study, these show a great diversity in the changes and recommendations for pregnant women who show the pathology.

Keywords: HIV and pregnancy, Nutrition and HIV, HIV in pregnant and lactating women

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Introduction

What is HIV?

The World Health Organization defines HIV as a human immunodeficiency virus (HIV) that is responsible for infecting the cells of the immune system, altering or canceling their function.[1] The infection causes a progressive deterioration of the immune system. The immune system is considered to be deficient when it is no longer able to do its job of fighting infection and disease. Acquired immunodeficiency syndrome (AIDS) is a term applied to the most advanced stages of HIV infection and is defined by the presence of any of the more than 20 opportunistic infections or HIV-related cancers. HIV can be transmitted through vaginal, anal, or oral sex with an infected person, transfusion of contaminated blood, or sharing needles, syringes, or other sharp instruments. It can also be transmitted from mother to child during pregnancy, childbirth and breastfeeding.

Epidemiology

Mexico, according to joint estimates made by Onusida-Censida at the end of 2014, there were 180,000 people living with HIV. 2 The prevalence in the population aged 15 and over is estimated at two per thousand. It is important to mention that 80 percent of the cases correspond to men and 20 percent to women, which means a ratio of 4:1. 95.1% of HIV cases are the result of unprotected sexual relations; 2.9% were produced by blood and 2.0% by perinatal transmission.[2] The national incidence rate in the period 1983-2014 was 186.7 cases per 100,000 inhabitants. The five entities with the highest rates were: Federal District, Yucatan, Veracruz, Baja California and Campeche. The five entities with the lowest rates were: Zacatecas, Guanajuato, Coahuila, Hidalgo and Durango.

Pathophysiology

HIV infection produces an alteration of the genetic code of susceptible cells, after infection, the resulting provirus can remain inactive for a considerable period of time. This inactivity contributes to the observed variation in the latency of the disease state. The trigger for active replication after a period of dominance is currently unknown. Once viral replication begins, the host cell dies. Over a period of time, CD4 cells decrease in number and immune function declines.[3] HIV infection is due to the fact that one of two similar retroviruses known as HIV-1 and HIV-2 will destroy CD4 + lymphocytes and with this compromise the cell unit, having a greater risk of certain infections and cancers.[3] The initial infection may manifest as a non-specific disease, and the risk of other manifestations or symptoms appearing will be proportional to the CD4 + lymphocyte depletion count.[3] This disease can directly damage the brain, gonads, kidneys, and heart, causing cognitive impairment.

Consequences and general manifestations of HIV

Infections due to other bacteria, viruses, fungi, or parasites cause severe HIV symptoms and tend to progress more quickly in people. However, some people do not have symptoms until months or even years after contracting the virus. About 80 percent of people may develop a series of flu-like symptoms, known as acute retroviral syndrome, which appears about 2 to 6 weeks after infection.[5]

Early symptoms of HIV infection may include fever, chills, joint and muscle pain, swelling, sweating, enlarged glands, rashes, tiredness, weakness, and unintentional weight loss. These symptoms could also appear because the immune system is fighting various types of viruses. However, people who experience many of these symptoms

and have any suspicion that they have been infected with HIV in the last few weeks should be tested.[5]

Pathophysiological aspects of malnutrition and HIV/AIDS

Protein-energy malnutrition in patients with HIV is caused due to problems of low energy and protein intake, due to the side effects of antiretroviral drugs, since these cause alterations in taste, smell, gastroparesis, odynophagia, system disorders. Central Nervous (CNS). 4 Protein-energy malnutrition in general is frequent in hospitalized patients (25-60%) and even more so at hospital discharge. In patients with HIV infection, the prevalence is 36-88% (>85% in advanced stages).[12]

Another common problem is malabsorption of nutrients caused by HIV enteropathy, intestinal pathogens, Kaposi's sarcoma, intestinal lymphoma, drugs, and malnutrition itself that causes hypoalbuminemia and produces structural and functional alterations in the intestine.[5] Among the most studied micronutrients we have vitamin A, E, zinc, selenium, complex B and copper. Its deficiency influences various functions of the immune system, which accentuates the immunodeficiency that leads to the stage of AIDS.[13]

The process of digestion of food and protein synthesis are affected by HIV, causing altered metabolism. Before any symptoms appear, the body's energy requirement increases. This could be due to the increased activity of the immune system. These people need more energy just to maintain their weight. Levels of various hormones can affect metabolism. Cytokines also play an important role in wasting syndrome and are defined as proteins that cause inflammation to help the body fight infection. People with HIV have very high levels of cytokines. This causes the body to produce more fat and sugar, but less protein.[4]

Oxidative stress occurs in patients with HIV due to chronic immune activation that produces alterations in cell function, as well as extracellular factors, such as Tumor Necrosis Factor (TNF), which produce a cascade of reactions causing lipid peroxidation and leading to the programmed cell death (apoptosis).[4]

Diagnosis

The diagnosis of HIV infection is generally made by indirect methods, demonstrating the presence of antibodies against HIV-1/2. The presence of antibodies is a consequence of the person's humoral response against the virus and occurs in 100% of cases. However, these antibodies do not have a protective effect, but will be present throughout the person's life.[8] Direct methods can also be used for diagnosis, that is, those that detect the virus, its antigens or its genetic material, among them is viral culture, which is expensive, requires a lot of time and special facilities, the detection of viral antigens, (antigen p24), which are insensitive methods and the detection of the viral genome by RT-PCR, real-time PCR or the detection of proviral DNA.[8]

Serum or plasma samples are used for conventional and rapid HIV detection tests and for confirmatory testing. In the case of rapid tests, most work with whole blood samples obtained by fingerstick. However, all rapid reactive tests must be confirmed by ELISA and Western blot. Currently there are rapid tests that use other body fluids for the detection of HIV, such as oral fluid (crevicular fluid) that are available in Mexico and that perform well.[8] Most screening tests are based on the ELISA or EIA principle. These tests are sensitive enough to avoid false negative results and have the ability to detect various subtypes of HIV. The time they take to perform varies between 2 to 6 hours. The result of these tests is considered as reactive or non-reactive and should never be considered as a single test for the diagnosis of HIV infection. Rapid HIV detection tests also detect antibodies using techniques such as immunochromatography or latex particle agglutination, and, like ELISA tests, must be confirmed. These types of tests should not be considered to demonstrate the circulation of HIV -2.

There are situations such as immunizations, autoimmune diseases, vaccines, etc., in which it is possible to obtain false positive results. Considering the above, the results must be expressed as "reactive" and not as positive and thus avoid mistakes and for this reason they must be evaluated again with a confirmatory test. The Western Blot test is used to confirm if a person is infected with HIV when ELISA tests have been reactive. In this test, the HIV proteins are found on a nitrocellulose strip separated according to their molecular weight and it is possible to identify antibodies against each of them. For the interpretation of the WB result, different criteria have been established by the different leading international health organizations. In most cases, a positive result will be when there are 2 bands of different genes of the main proteins or glycoproteins of HIV. Only until a positive Western blot is obtained can it be confirmed that the person is infected with HIV.[8] The most widely used methods are the determination of viral RNA and proviral DNA. These tests are used to establish the diagnosis in children of women carrying HIV and in cases where the diagnosis cannot be established with antibody tests, but only in centers where there are qualified personnel for their interpretation.

Pharmacotherapy

HIV medicines are called antiretrovirals. These drugs stop the virus from reproducing (multiplying), which lowers the level of HIV in the body, called the viral load. An undetectable viral load means that the level of HIV in the blood is too low to be detected with a viral load test. In case of pregnancy, all HIV-positive pregnant women should take antiretrovirals for their own health and to prevent mother-to-child transmission of the virus (also called perinatal transmission). The risk of perinatal transmission is lower when the HIV-positive woman has an undetectable viral load. Maintaining an undetectable viral load also helps keep the mother-to-be healthy. Most HIV drugs are safe to use during pregnancy. In general, HIV medicines do not increase the risk of birth defects.[10]

HIV and pregnancy

Normally in pregnancy there is an immunodeficiency with decreased levels of immunoglobulin and cellular immunity, among other changes, which leads one to think that pregnancy in HIV-positive women could accelerate the progress of the infection, but prospective studies have been contradictory. in your results. Pregnancy appears to have little effect on disease progression in asymptomatic HIV-positive women, but rapid progression may occur in advanced-stage women. This is what is happening in some Central African countries where AIDS has become a common cause of maternal mortality. This does not appear to be due to pregnancy-induced disease acceleration, but rather because more women with advanced disease become pregnant resulting in high rates of HIV complications.

In relation to the effect of HIV infection on pregnancy, many authors agree in mentioning several of them, such as: spontaneous abortions, ectopic pregnancy, infection of the genital tract by other agents (N. gonorreae, Chlamydia trachromatis, Candida albicans, Trichomonas vaginalis and syphilis). Syphilis was present in 33%

of HIV-positive pregnant women in a study conducted in South Africa, so all HIV-positive pregnant women should be screened with serology for syphilis, even in low-prevalence regions. Other frequent complications in HIV-positive women are bacterial pneumonia, urinary sepsis, herpes zoster, Kaposi's sarcoma, and especially tuberculosis, which is the most common opportunistic infection.[9]

Preterm delivery occurs with a double frequency, premature rupture of membranes and abruptio placentae, more common in HIV-positive women in Kenya and South Africa, have also been described. In Rwanda and Zambia, significant differences in newborn birth weights between HIV-positive and negative mothers are reported. Likewise, an increase in fetal deaths is reported. In the postpartum period, infectious complications are also more common in HIV-positive women.

The management of pregnant women with HIV must be multidisciplinary, combining medical, nutritional, psychological, obstetric treatment, counseling, and social support, for all of which requires an adequate infrastructure of health services and the possibility of having access to them. Prenatal care does not differ substantially from that provided to HIV-uninfected pregnant women, since most HIV-positive women are asymptomatic and present no problems. Other sexually transmitted infections should be investigated and treated, if any.

The only intervention that has proven to be effective in reducing mother-to-child transmission is the use of antiretroviral drugs (zidovudine, AZT) alone or in combination with others during pregnancy, delivery and in the first 6 weeks of the baby's life. together with the termination of pregnancy by cesarean section and the elimination of breastfeeding. Antiretroviral treatment is aimed at improving the health of the mother and preventing mother-to-child transmission, and with it a decrease between 40 and 66% is reported, depending on whether it is applied early or late in the pregnancy. It is currently considered preferable to use 2 antiretroviral drugs with the addition of a protease inhibitor.

Nutrition with HIV and pregnancy

It is extremely important that pregnant women with HIV have good nutrition, as this will help maintain general health, immune system, a healthy weight and absorb medications against HIV. As previously mentioned, HIV can increase metabolic rate and caloric and nutrient needs, while decreasing nutrient absorption, potentially causing malnutrition problems.

Energy and protein

The macronutrient intake recommendations are based on the calculation of the Basal Energy Expenditure (GEB) according to Harris and Benedit, additionally calories must be included according to the trimester of pregnancy in which the patient is.[10]

Estimated energy expenditure (EEE) Women > 19 years, normal weight, overweight/obese.

GEE= 387 – (7.31 x age [years]) + PA x [(10.9 x weight [kg]) + (660.7 x height [m])]

Pregnancy: + 0 kcal/day 1st trimester; + 340 2nd quarter; + 452 3rd quarter.

Calories needed = GEB x activity factor x injury factor

The protein intake can be calculated according to the degree of infectious stress according to the following values (g prot/kg).

I. Patients without acute infection = 1.0 to 1.5 g.

II. Patients with moderate infectious stress = 1.5 to 2.0 g.

III. Patients with severe infectious stress = 2.0 to 3.0 g.

Lipids

The immune system is affected by both the quantity and the quality of lipids in the diet. Long-chain omega-6 fatty acids have an immunosuppressive effect when administered in amounts significantly in excess of requirements to prevent fatty acid deficiency. These effects inhibit cytotoxic cell function, decrease cytokine secretion, impair leukocyte migration, and adversely affect the reticuloendothelial system. Omega 3 fatty acids compete with omega 6 fatty acids for enzymes that produce prostanoids and leukotrienes. The compounds produced by the enzymatic interaction with omega 3 fatty acids are less inflammatory and immunosuppressive than those produced by omega 6. Therefore, when HIV patients use these omega 3 EPA and DHA fatty acids as dietary supplements in amounts of 100 mg EPA + 200 mg DHA enhance the cell-mediated immune response and inhibit the production of immunosuppressive prostaglandins.

Because medium-chain triglycerides are readily absorbed, they are useful in patients with malabsorption and maldigestion syndromes. These triglycerides provide a readily available source of energy without the side effects of long-chain triglycerides, with the added benefit of enhancing mononuclear phagocytic function. Some sources of MCT are olive oil, coconut oil, and palm oil.

Finally, short chain triglycerides (SCTs) can be routinely used as a dietary supplement. Like medium chain triglycerides, they provide an immediate source of energy without immunosuppressive effects. TCCs are the preferred energy source for the colonic mucosa, have been shown to improve healing of the anastomosis and reduce atrophy of the intestinal mucosa associated with disuse of the digestive tract.

Micronutrients

It is recommended to cover the needs of vitamins and minerals during pregnancy is an important part of nutritional treatment. It is recommended to pay attention to the intake of folate (400 mcg before pregnancy and 600 mcg during pregnancy), iron (27 mg) and calcium (1000 mg). However, one must be aware of the deficiency of certain micronutrients in this disease, such as: vitamin A (770 mg), vitamin B6 (1.9 mg), vitamin E (15 mg), zinc (11 mg) and selenium (60 mcg), as these can adversely affect various functions of the body system and the development of the baby. Contributions of iron, folic acid, as well as vitamin A should be provided, since low levels of the latter have been associated with an increase in mother-to-child transmission.

Oxidative stress

Oxidative stress is increased in people living with HIV/AIDS, causing increased cell damage due to an overproduction of free radicals and a decrease in defenses. That is why it is important that the diet of those who suffer from this disease, and more so in pregnancy, is high in antioxidants such as vitamin E (15 mg per day), and vitamin C (85 mg per day). This is why the manual for food and nutritional care in people with HIV/AIDS recommends adequate and appropriate vitamin and mineral supplementation under medical supervision, since the metabolism is weakened at the level of the different tissues in general, and the immune system. which conditions a greater expenditure of energy and nutrients, and therefore requires a greater contribution of them so as not to affect other metabolic pathways, based on the allowable dietary recommendations (RDA, for its acronym in English.

Nutritional recommendations for pregnant women with HIV are aimed at

I. Preserve body muscle mass and avoid physical exhaustion.

II. Provide adequate levels of nutrients.

III. Reduce the effects of malabsorption.

IV. Maintain adequate growth and development.

V. Reduce or improve the symptoms and complications of the disease.

VI. Increase the energy requirement along with body muscle mass to avoid physical exhaustion.

VII. Reduce the effects of malabsorption and take care of critical nutrients such as vitamin A, B6 and E, zinc and selenium.

VIII. Maintain adequate growth and development.

IX. Reduce or improve the symptoms and complications of the disease.

X. It is recommended to follow a white diet with the following standards in the preparation of food for immunocompromised patients:

XI. Avoid raw fruits and vegetables.

XII. In early stages, the consumption of well washed and peeled fruits and vegetables previously submerged in sodium hypochlorite is allowed. Before consuming, rinse well under running water.

XIII. Use clean utensils to open and serve canned food.

XIV. Cover all food with plastic wrap or paper.

XV. Culinary preparations must be cooked at temperatures above 100ºC.

XVI. Prepare and serve the dishes immediately before consumption.

XVII. Cold dishes must be refrigerated at minus 4°C and frozen dishes at less than 18°C.

XVIII. Take care of the usual basic rules in hygiene and food handling and strict antisepsis of cutlery and kitchen utensils.

XIX. Avoid contaminating food with kitchen utensils.

XX. Do not use the same table to chop raw and cooked food.

XXI. Keep meat and fish in the refrigerator (separated from each other and isolated from other foods).

XXII. Do not serve undercooked meat and fish.

XXIII. The remains of food from the prepared dishes must be discarded.

Conclusion

HIV is a virus that weakens the immune system, altering or canceling its function. For this reason, it is essential that pregnant women with HIV have good nutrition, based on the permitted dietary recommendations in order to obtain a stable state of health that helps to have a strong immune system and maintain a healthy weight, along with anti-disease medications disease.

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None.

Conflicts of interest

The author declares there is no conflict of interest.

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