

The relationship between the of prolidase activity and rheumatoid arthritis

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Abstract

This study was conducted for the period from 15/12/2019 to 30/01/2020 in the laboratories of Samarra General Hospital and outpatient clinics, as 40 samples were collected (20) a sample infected with rheumatoid arthritis diagnosed by doctors and (20) healthy samples as a control group. Their ages ranged between (35-80) years. As 6 ml of venous blood was withdrawn and (4) ml was placed in plastic tubes and free from anticoagulant for the purpose of Determination concentrations (Prolidase, MDA, Ceroplasmin) and (2) ml to Erythrocyte Sedimentation rate ESR, and the results were statistically analyzed by testing the variance at a significant level $P \leq 0.05$. The results showed a significant increase in the effectiveness of prolidase enzyme in patients with rheumatoid arthritis compared to the control group at a significant level $P \leq 0.05$ and an increase in the concentration of Ceroplasmin, ESR and malondialdehyde in the patients group compared to the control group $P \leq 0.05$

Keywords: Prolidase Activity, Cp, MDA, rheumatoid arthritis

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INTRODUCTION

Rheumatoid arthritis (**RA**) is a public health problem that affects the lives of millions of people around the world, leading to higher costs for health care (Carvalho et al., 2016). Rheumatoid arthritis is a common disease around the world, as its prevalence rate in the United States of America is 1-0.5% (Riemsma et al., 2004). Colombia is 0.9% (Díaz-Rojas et al., 2016), in France 0.31% and Serbia 0.34% (Zlatković-Švenda et al., 2014). Arthritis treatment focuses on relieving symptoms and improving the ability of the joints to perform its function, so the need sometimes arises to try various treatments or combine different treatments with each other in order to be able to choose or obtain the best treatment for the patient, as there are many drugs that are used to treat inflammation (Williams et al., 1993). Rheumatoid arthritis is an autoimmune disease. It refers to any disorder that affects the joint. It includes many symptoms, the most important of which are Joints stiffness, joint pain, and redness, swelling and difficulty in movement. Difficulty in movement, and thus it leads to loss of the function of the joint. And it may affect other devices (Michel et al., 2011; Peluola et al., 2016).

Rheumatoid arthritis takes many forms that are different in its causes, symptoms and methods of treatment (Eric et al., 2013). Mentioning environmental factors is not limited to smoking only, but there are factors such as food, deficiency in vitamins, alcohol

consumption, and infection with viruses and bacteria (Tobón et al., 2009). All of these factors are outside the body and have no genetic basis for them, so they are called non-genetic host factors (Silman and Pearson, 2002). The importance of the role of EBV (Epstein Barr Virus) in the occurrence of rheumatoid arthritis disease was noted, as it found an abnormal increase in the number of B lymphocytes infected with this virus in the blood of a patient with rheumatoid arthritis, as this virus stimulates the production of autoantibodies. Among them is the rheumatic factor (Balandraud and Roudier, 2017). The **prolidase enzyme activity** is one of the hydrolysis enzymes and the enzyme relies on manganese as a catalyst for it (Lowther et al., 2002). This enzyme is found in mononuclear cells, neutrophils, red blood cells, brain, heart tissue, uterine tissue cells, spleen and intestine, and has an important role in many physiological aspects. And pathological conditions such as healing of wounds, infections, vascular formation that causes cancer and its spread (Palka & Phang, 1997). Abnormal activity of the enzyme has been observed when liver disorders and osteoporosis occur, and the effectiveness of this enzyme can be used as an indicator for the detection of

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various types of malignant tumors such as breast cancer accompanied by a decrease in the deposition Collagen(Cechowska-Pasko,2006),endometrial cancer (Ariozetal.,2009), and its activity has been associated with delayed intrauterine growth(Toy et al.,2009), and in heart diseases(Sezen et al.,2010), high blood pressure(Demirbag & Gur,2007) and mental disorders(Bahceci et al.,2015), and measuring enzyme activity is not only a tool for diagnosing associated diseases(Kurien & Porter,2006),but also for clarifying pathophysiology. The enzyme activity has also been associated with oxidative stress in various Diseases(Arikanoglu et al.,2013). It has been found that prolidase enzyme activity and inflammation can be associated with each other during pulmonary fibrosis (Turkbeyler et al.,2012). (CP) is an internal antioxidant and is one of the proteins associated with minerals. Seroplasmin transports copper from the liver to various other tissues of the body, and it always reflects the level of seroplasmin and largely the level of copper concentration in the blood serum, and its role as an antioxidant is to hold copper and prevent it from participating in oxidation(Groff and Gropper,2000). The level of seroplasmin is affected when certain diseases such as high blood pressure rise Hypertension, Hyperlipdemia, diabetes, and various heart disorders(Vatan et al.,2013). Malondialdehyde-MDA is one of the final products of the oxidation of Unsaturated fatty acids(Al-youzbaki et al.,2013). It is also highly toxic due to its ability to interact with protein and DNA molecules(Martini et al., 2014), and it is an important indication of the occurrence of the process of lipid peroxidation and evidence of the occurrence of some diseases, especially atherosclerosis (Gopal et al; 2012).And MDA is one of the most important evidence that is used to search for an increase in oxidation in the body's tissues.

MATERIAL AND METHODS

This study was conducted for the period from 12/15/2019 to 01/30/2020 in the laboratories of Samarra General Hospital and outpatient clinics, as 40 samples were collected (20) were infected with rheumatoid arthritis diagnosed by doctors and (20) healthy samples returned control group and their ages ranged between (35-80) years. As 6 ml of venous blood was withdrawn and (4) ml was placed in plastic tubes and free from anticoagulant for the purpose of estimating concentrations (Prolidase, MDA, Cp,) and 2) ml) to measure ESR, and the effectiveness of prolidase enzyme in the serum was evaluated serum prolidase activity for people with rheumatoid arthritis by method. Internal antioxidants were evaluated. Determination of serum ceruloplasmin was determined by the method. The MDA Malondialdehyde was also evaluated according to the method. The results were also

Table 1. Comparison of patients and control group in Prolidase enzyme activity Cp,MDA,ESR

Variable	Control group	Patient group	p
Prolidase Iu /L	85.1 ±35.8	95.6 ±35.9	**
Ceruplasmine (gm/l)	22.2 ±5.14	30.9 ±11.1	**
MDA (µmol/L)	4.55± 1.02	5.63± 1.68	**
ESR(Mm/h)	12.7± 6.6	41.5± 23.9	**

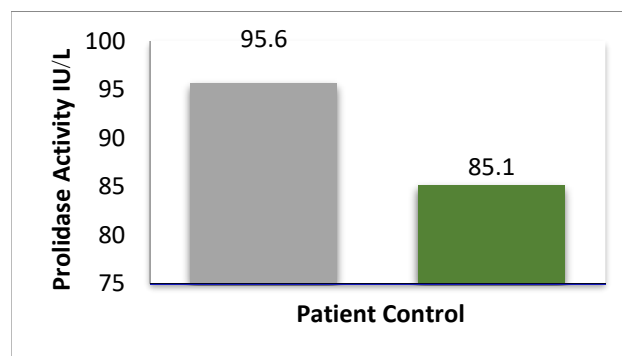


Fig. 1. The effectiveness of prolidase enzyme in the Patient group compared to the control group

statistically analyzed by testing the variance at the level of significance $P \leq 0.05$ (Alrawi 1986).

RESULTS

From **Table 1**, **Fig. 1**, the results showed a significant increase in the effectiveness of prolidase activity in a group with rheumatoid arthritis compared to the control group at the level of significance $P \leq 0.05$ as in **Fig. 1** and the results of this study are consistent with (Ugan et al., 2016), Patients with rheumatoid arthritis to the positive relationship between Rheumatoid Factor and C-Reactive Protein, and the rise in the effectiveness of the enzyme is related to diseases that may accompany rheumatoid arthritis, including osteoporosis and chronic liver disease and thus lead to the release of collagen. The release of collagen, so the rise in effectiveness. The enzyme is due to the progress of the disease (rheumatoid arthritis) (Uçar et al.,2013). The increased effectiveness of prolidase is useful in predicting the risk of joint damage and thus the occurrence of rheumatoid arthritis,(Watanabe et al.2015).

From **Table 1**, **Fig. 2** the results showed a significant increase in the group of patients with rheumatoid arthritis compared to the control group at the level of significant $P \leq 0.01$. The reason for the increase in the concentration of Ceroplasmin is that it works to provide protection against oxidative stress. There is a positive relationship between CP and ESR, and thus the Ceroplasmin, which is a sharp-phase protein that is made by the liver and released into the bloodstream where it is one of the most prominent antioxidants that have the ability to remove free radicals(Cogalgil and Tays, 2002, Lopez- Avila et al.,2006) and thus increases the concentration of CP during rheumatoid arthritis. Ceroplasmin is a major plasma and articular antioxidant (albumin). It is

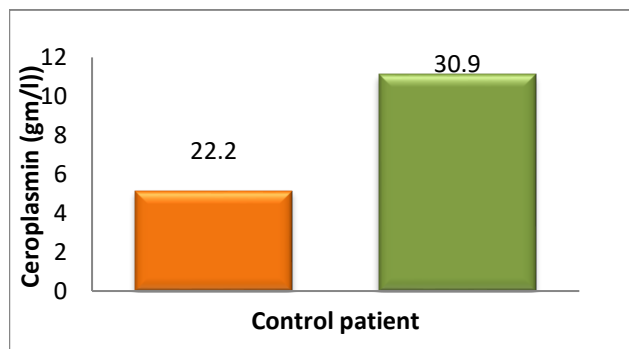


Fig. 2. Ceroplasmin concentration in the Patient group compared to the control group

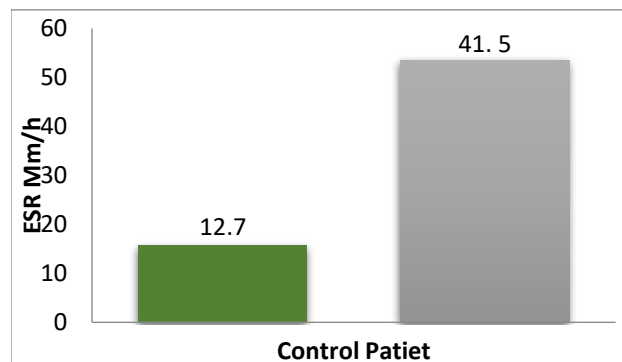


Fig. 4. Erythrocyte sedimentation Rate in the patient group compared to the control group

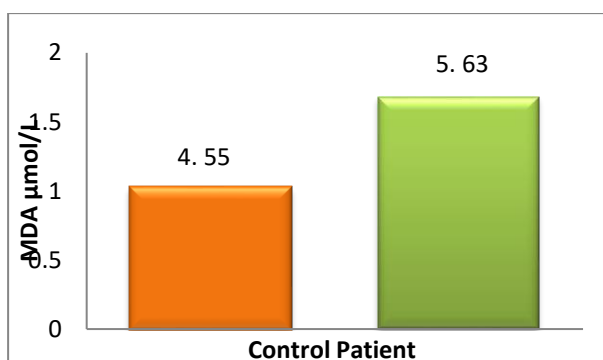


Fig. 3. Concentration of Malondialdehyde in the patient group compared to the control group

responsible for 70% of the defensive ability against the effect of free radicals (Louro et al., 2000).

From **Table 1**, **Fig. 3**, the results showed a significant increase in the concentration of malondialdehyde in patients with rheumatoid arthritis compared to the control group at the level of significant $P \leq 0.01$ that the levels of oxidative stress in patients with rheumatoid arthritis show great importance Compared to the control group (García-González A, et al., 2015), in the human body there are at least 16 types of collagen of these

types collagen I, II and III collagen is the most abundant is the first type of collagen found in the bones (Lodish et al., 2000). The shift in osteoporosis in rheumatoid arthritis is faster than normal people may lead to stress Oxidative stress increased levels of prolidase in rheumatoid arthritis patients (Watanabe et al., 2015).

Erythrocyte Sedimentation rate ESR

The results from **Table 1**, **Fig. 4** showed a significant increase in the rate of erythrocyte sedimentation rate in the blood of persons with RH, compared to the control group and at the level of significance $P \leq 0.01$. The reason is the high rate of erythrocyte sedimentation rate in People with rheumatoid arthritis to the motor role (IL-1) in increasing the infiltration of white blood cells from the bones into the bloodstream and increasing their accumulation and numbers (Willoughby et al., 1986). Forces called Zetu-potential forces that lead to this increase and this is consistent with Arvidson (2003); Wolf and Michaud (1994) In rheumatoid arthritis, fibrinogen, alpha-2 macroglobulin and immunoglobulin are increased which in turn helps in collecting red blood cells and thus an increase in the level of ESR (Youssef et al., 1983).

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