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Original Research Article

Study of serum level of Vit. E, Malondialdehyde (MDA) and reduced glutathione (GSH) in RA patients & Comparison with normal subjects

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Abstract: Rheumatoid arthritis (RA) is a chronic disease with unknown etiology. The aim of this study to estimate the serum Vit. E, Malondialdehyde (MDA) and Reduced glutathione (GSH) in RA patient and comparison with normal healthy subjects. In the study the serum level of vit. E was estimated by method given by Catignani & Bieri. Serum MDA is estimated by a thiobiteric acid assay method and serum GSH were determined by the method of Paglia and Valentine. Serum level of Vit.E and Reduced glutathione were significantly reduced in RA patient as compared to control group ($p < 0.005$ for Vit.E and $p < 0.005$ for GSH). Serum MDA level in RA patient was significantly higher than control group.
Keywords: Rheumatoid arthritis (RA), Vit.E, Malondialdehyde (MDA), reduced glutathione (GSH), Super oxide dismutase (SOD), Catalase, glutathione peroxidase.

INTRODUCTION

Rheumatoid arthritis (RA) is a chronic, multisystem disease with an unknown etiology affecting about 1% of the world population [1]. Rheumatoid arthritis is a heterogeneous disease with spectrum of clinical severity ranging from mild arthritis to crippling joints disorder with internal organ involvement. Clinical disease progression is RA is usually monitored by standard clinical, Laboratory and functional indices, whereas serial X-rays of hands and feet asses' structural damage [2]. RA is characterized by persistent inflammation in the synovial membranes of joints, associated with migration of activated phagocytes and other leukocytes into synovial and periarticular tissue [3]. Early identification of patients with aggressive destructive disease is important, not only for prognostic, but also for therapeutic reasons [4]. During phagocytosis, monocytes, neutrophils and macrophages generate superoxide radicals, hydrogen peroxide and highly reactive hydroxyl radicals [5]. There cytotoxic reactive species (ROS) may cause oxidative damage in the cells [6]. Activated oxygen inter mediates together with highly reactive radicals, such as the hydroxyl radicals, are able to destroy membrane lipids, proteins deoxyribonucleic and hyaluronic acid and cartilage [7]. Enzymatic mechanism includes super oxide dismutase (SOD), catalase ad glutathione peroxidase. Vit. E and glutathione one of this major non enzymatic antioxidants in the body [8]. Plasma Vit.E and glutathione were found to be decreased in patients with RA

Oxygen Free radicals have been implicated as mediators of tissue damage in patients with RA. Hence the aim of the present study was to assess the lipid peroxidation and non-enzymatic antioxidant status of patients with RA

MATERIAL AND METHODS

The present study was conducted on 50 healthy controls and 50 clinically established rheumatoid arthritis patients attending the outpatient department of rheumatology clinic. M.B Hospital affiliated to R.N.T. Medical College, Udaipur. Informed consent was obtained from all patient and controls serum Vit. E, MDA &GSH level was measured by UV-VIS Spectrophotometer. A through physical examination was carried out on all the patients. Routine hematological & radiological investigation was also done. The presence of RA in patients was diagnosed by carrying out X-ray analysis of joint destruction as well as RF, C-reactive protein& antinuclear antibody test.

Inclusion criteria:

Subjects with normal nutritional habits without supplementing with any Vitamins during the last there months included in the study.

Exclusion criteria:

None of these subjects were alcoholic or chronic smoker to none of them suffered from any systemic diseases like hypertension, diabetes, not having any history of trauma to joints to also subject's history receiving any inflammatory drugs in the three months to be excluded from the study.

The quantification of Vit.E was done by the method of catignani and Bieri [9] and Miller *et al.;* [10]. The reduced glutathione were determined by the method of paglia and Valentine [11] using a commercially available kit. MDA concentraton will be estimated as reactive substances by a bitrilic acid assay method described by Buege and Aust [12].

RESULT & DISCUSSION

The mean Vit.E cone was found to be decreased to 6.0 ± 1.3. The decreased level of serum Vit.E in RA patient was statistically highly significant as compared to the normal control group 8.4. ± 1.6 as it evident by P-value (P< 0.005).

The result of present study of serum Vit.E concentration was similar to result obtained by previous study which suggested that serum Vit.E level in RA patients decreases significantly as reported by Kajanachumpors. *et al.;* [13], F.Karatas *et al.;* [14].

The mean serum MDA concentration was found to be increased to 3.79 ± 1.0 with a range of 1.14 - 5.95 nmoles/ml in Rheumatoid arthritis patients. The increase level of MDA in RA patients was statistically highly significant as compared to that of normal control group 1.69 + 0.43 n miles/Ml while it ranged from 0.67-2.59 n miles/ml as evident by P-value (P-0.005).

The result of present study of MDA concentrate was similar to results obtained by previous studies which suggested that serum MDA level in RA patient increases significantly. As reported by lunec *et al.;* [15], Gambriz *et al.;* [16], Chaturvedi *et al.;* [17].

The mean serum glutathione concentration was found to be decreased to 8.28 ± 1.0 mg/dl in rheumatoid arthritis. The decreased level of serum glutathione in RA was statistically highly significant as compared to that of normal control group 11.78 ± 1.40 mg/dl with range 9.19 -15.2 mg/dl as it evident by P-value (P< 0.005).

The result of present study of serum Glutathione concentration was similar to results obtained by previous studies which suggested the serum glutathione level in RA patients decrease significantly as reported by Kamanly *et al.;* [18],Vijay *et al.;* [19], Aghieszka *et al.;* [20].

The decrease in serum Vit.E and Glutathione (GSH) level might be due to various oxygen radical stresses have been shown to results in G S SG. Reduced glutathione is also capable of directly, scavenging radicals and peroxides by being oxidized to either GSSG or to a mixed disulphide.

The decreased in serum MDA level in RA patients might be due to increased generation of reactive oxygen species or free radicals due to excessive oxidative damage generated in these patients.

Table 1: Comparison of mean values of Vit.E, MDA and Glutathione in plasma, in patients of RA and controls

Blood parameters	Normal Control subjects(n=50)	Rheumatoid arthritis patients (n=50)	Significant P-value
Vit.E µg/ml	8.4 ± 1.6	6.0 ± 1.3	<0.005
MDA (malondi aldehyde)n mol/ml	1.69 ± 0 .43	3.79 ± 1.0	<0.005
Reduced Glutathione (GSH)mg/dl	11.78 ± 1.40	8.28 ± 1.0	<0.005

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