Proforma
PROFORMA

Study of nephrotic syndrome

1. Identity /Social Character

- Case No.: 
- Name: 
- Age/Sex: 
- Weight: 
- Address: 
- Occupation: 
- Urban/Rural: 

2. Presenting Complaints / symptoms

- Edema
- Lower back pain
- Loss of weight
- Hypertension
- Oligouria
- Weakness
- Proteinuria
- Infection
- Hematuria
- Vomiting
- Others

3. History of present illness

4. History of previous illness

5. Family History

6. Personal History
7. INVESTIGATION

i. Electrolytes

- Serum sodium (Na)
- Serum Potassium (K)

ii. Minerals

- Serum Zinc
- Serum Copper

iii. Lipid Profile

- Triglycerides
- Total Cholesterol
- VLDL Cholesterol
- HDL Cholesterol
- LDL Cholesterol

iv. Lipoprotein (a)

v. Total Antioxidant Capacity

vi. Homocysteine
Publications
Oxidant stress in primary nephrotic syndrome in relation to dyslipidemia

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ABSTRACT

Nephrotic Syndrome is a consequence of an imbalance between oxidants and antioxidants. The present study aimed to assess oxidants and antioxidants status in relation to dyslipidemia in adults Nephrotic Syndrome patients and during remission. The study dealt with 75 adults diagnosed to have primary Nephrotic Syndrome (PNS) and all were given standard oral corticosteroid induction therapy and 50 normal healthy adults were kept for control. Blood samples were analyzed for quantification of albumin, malondialdehyde (MDA) as an index of lipid per-oxidation, Total cholesterol(TC), Triglycerides(TG), High density lipoprotein cholesterol (HDL-C), Low density lipoprotein cholesterol (LDL-C), Total antioxidant capacity (TAC), Copper and Zinc from control and experimental patients. Significantly increased level of MDA, TC, and TG was noted while significantly decreased levels of HDL-C, TAC, Zinc and Copper were noticed in the patients with Nephrotic Syndrome as compared to healthy control. However, after standard corticosteroids induction therapy significant reduction in MDA, TC, TG, were observed but no significant change in LDL-C was observed. Although improvement in TAC, HDL-C albumin, Zinc and Copper were observed after standard corticosteroids induction therapy.

1. Introduction

The Nephrotic Syndrome is one of the best known presentations of adult or pediatric kidney disease. The term describes the association of (heavy) proteinuria with peripheral edema, Hypoalbuminemia and hypercholesterolemia. Low TAC concentrations have been reported in the proteinuric phase of SSNS during the first episode [1]. An abnormality in oxidative system in patients with Nephrotic syndrome has been reported [2, 3]. Dyslipidemia of NS is also known to be linked to oxidative reactions and atherosclerosis [4]. Direct assessment of reactive oxygen species (ROS) is not feasible because of the extremely short half-life of the free radicals [4]. Therefore, the oxidative activity must be measured indirectly by the levels of lipid membranes per oxidation by-product; malondialdehyde (MDA). Also, by measuring the Total Antioxidant Capacity (TAC), albumin (which is an antioxidant protein and its reduced thiol moiety on cystein 34 plays direct role of antioxidant) [5][6], serum zinc & copper level [7]. The present study, aimed, was to assess oxidant (in terms of serum levels of MDA) and antioxidant status (in terms of serum levels of albumin, TAC, Zinc and Copper), in relation to dyslipidemia (in terms of serum levels of TC, LDL-C, HDL-C, TG,) in adult Nephrotic Syndrome patient and during remission phase of steroid sensitive Nephrotic syndrome (SSNS).

2. Materials and Methods

2.1 Study population-Human

Present study was conducted during January 2007 to December 2009 on Nephrotic Syndrome subjects who were outdoor patients of Nephrology Department of M.G.M. Medical College and private clinical of Indore (M.P), India.

2.2 Test-Disease: Nephrotic Syndrome.

The present study was conducted on 75 adult Nephrotic syndrome patients. Patients were diagnosed to have primary Nephrotic syndrome according to the criteria of the International Study of Kidney Disease in Children (ISKDC) 1981. The patients suffering from other diseases which may lead to oxidative stress such as diabetes, inflammatory disease, cardiac disease, hepatic impairment and respiratory diseases or other systemic disease as well as smokers and alcoholics were excluded from the study.
study. The study was approved by the ethical committee of the D.A.V.V. Indore.

2.3 Experimental design

The present study was conducted on 50 healthy adult control subjects and on 75 adults' Nephrotic syndrome patients. Studied subjects were divided in the following three groups.

A Control Group: In this group 50 normal healthy adults were included.

B Experimental Group 1: In this group 75 adult Nephrotic syndrome patients were included.

C Experimental Group 2: In this group 75 adult Nephrotic syndrome patients which were on remission after receiving standard oral corticosteroid induction therapy for one month were included.

2.4 Biochemical investigation

Fasting venous blood were drawn from all subjects. The blood was allowed to clot at room temperature and centrifuged at 5000 rpm for 10 minutes and then the serum was kept frozen at 70°C in aliquots until the time of assay of the parameters. The prospective study was carried out at Biochemistry laboratory of the Government Holkar Science College Indore (M.P.).

Biochemical parameters selected for present study included: Total Cholesterol, Triglyceride, HDL-Cholesterol Albumin, Zinc, and Copper were determined by using commercially available kit from Lab Kit diagnostics from Span in semi automated auto analyzer. LDL-Cholesterol level was calculated by using Friedewald's equation.

2.5 Measurement of serum TAC

Serum TAC was measured according to the method described by Koracevic et al. [8] in which the determination of Total antioxidant capacity is based on the reaction of Antioxidants in the sample with a defined amount of exogenously provided Hydrogen peroxide. The antioxidants in the sample eliminate a certain amount of the Hydrogen peroxide and the residual hydrogen peroxide is determined by an enzymatic reaction (the conversion of 3, 5 dichloro-2-hydroxy benzene sulphonate) produces colored product. Measure the absorbance at 532 nm wavelength.

2.6 Measurement of serum MDA

The colorimetric method described by Ohkawa et al. [9] was used to measure serum MDA level. The reaction of Thiobarbituric acid with MDA in an acidic medium at 95°C for 30 min produces pink colored thiobarbituric acid reactive product. The absorbance of the pink colored product was measured at 534 nm wavelength.

2.7 Statistical analysis

The SPSS software programmed ver. 15 (SPSS, Chicago, IL) was used to analyze the data statistically. Laboratory characteristics of patients were expressed as mean ± standard deviation (SD). ANOVA was used to compare these data between patients and controls. P values <0.05 was considered to be significant.

3. Results

Results obtained were summarized in Table's 1-3. Table 1 shows Comparison of all diagnosed biochemical parameter in healthy control group and experimental group 1 with SSNS. Significantly increased mean serum level of MDA, TC, LDL-C, TG (p<0.000) and significantly decreased level of HDL-C (p<0.001) in group 1 were observed when compared to healthy control. In serum level of MDA overall 185.55 % increase was observed in group 1. In serum level of Total cholesterol overall 79.22 % increase was observed in group 1. In serum level of triglyceride overall 195.15 % increase was observed in group 1. In serum level of LDL-C overall 100 % increase was observed in group 1. In serum level of HDL-C overall 8.99 % decrease was observed in group 1. Significantly decreased mean serum level of albumin, Zinc, Copper, TAC, were observed in group 1 when compared to healthy control (p<0.000). In serum level of Albumin overall 42.95 % decrease was observed in group 1. In serum level of Zinc overall 21.47 % decrease was observed in group 1. In serum level of Copper overall 17.0 % decrease was observed in group 1. In serum level of TAC overall 32.98 % decrease was observed in group 1. In serum level of MDA overall 185.55 % increase was observed in group 1. In serum level of Total cholesterol overall 79.22 % increase was observed in group 1. In serum level of triglyceride overall 195.15 % increase was observed in group 1. In serum level of LDL-C overall 100 % increase was observed in group 1. In serum level of HDL-C overall 8.99 % decrease was observed in group 1. Significantly decreased mean serum level of albumin, Zinc, Copper, TAC, were observed in group 1 when compared to healthy control (p<0.000). In serum level of Albumin overall 42.95 % decrease was observed in group 1. In serum level of Zinc overall 21.47 % decrease was observed in group 1. In serum level of Copper overall 17.0 % decrease was observed in group 1. In serum level of TAC overall 32.98 % decrease was observed in group 1.

Table 2 shows comparison of all diagnosed biochemical parameter in healthy control group and experimental group 2 with SSNS. Significantly different mean serum level of MDA, TC, LDL-C, and TG (p<0.000) were observed in experimental group 2 and insignificant difference was observed in serum LDL-C level of experimental group 2 when compared to healthy control. In serum level of MDA overall 75.94 % difference was observed in group 2. In serum level of total cholesterol overall 58.40 % difference was observed in group 2. In serum level of triglyceride overall 57.45 % difference was observed in group 2. In serum level of LDL-C overall 87.34 % difference was observed in group 2. In Serum level of HDL-C overall 3.59 % difference was remained in group 2. Significantly decreased mean serum level of albumin and TAC, were observed in group 2 when compared to healthy control (p<0.000). In serum level of Albumin overall 20.55 % difference was observed in group 2. In serum level of TAC overall 13.91 % difference was observed in group 2. Significant decreased level of HDL-C in experimental group 2 was observed when compared to group 1 (p<0.006). In serum level of MDA overall 39.04 % decrease was observed in group 2. In serum level of Total cholesterol overall 11.61 % decrease was observed in group 2. In serum level of triglyceride overall 46.65 % decrease was observed in group 2. In serum level of LDL-C overall 6.32 % decrease was observed in group 2. No significant difference was observed in serum level of Zinc and copper of experimental group 2 when compared to healthy control. In serum level of Copper overall 4.53 % difference was observed in group 2. In serum level of Zinc overall 0.72 % difference was observed in group 2.

Table 3 shows comparison of all diagnosed biochemical parameter in experimental group 2 and group 1 with SSNS. Significantly decreased mean serum levels of MDA, TC, and TG in group 2 were observed when compared to group 1 (p<0.000). Significant increased level of HDL-C in group 2 was observed when compared to group 1 (p<0.006). In serum level of MDA overall 39.04 % decrease was observed in group 2. In serum level of Total cholesterol overall 11.61 % decrease was observed in group 2. In serum level of triglyceride overall 46.65 % decrease was observed in group 2. In serum level of LDL-C overall 6.32 % decrease was observed in group 2. In serum level of HDL-C overall 5.93 % increase was observed in group 2. No significant difference was observed in serum level of Copper overall 4.53 % difference was observed in group 2. In serum level of HDL-C overall 39.04 % increase was observed in group 2. No significant difference was observed in serum level of Copper overall 4.53 % difference was observed in group 2. In serum level of HDL-C overall 26.41 % increase was observed in group 2. In serum level of Copper overall 15.18 % increase was observed in group 2. In serum level of TAC overall 28.46 % increase was observed in group 2.
Tables. Results obtained were summarized in Table's 1-3.

### Table 1. Comparison of all diagnosed biochemical parameter in Control and group 1 with SSNS.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Control</th>
<th>Group 1</th>
<th>Difference</th>
<th>% change</th>
<th>p-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Albumin (gms/dl)</td>
<td>4.33±0.33</td>
<td>2.47±0.57</td>
<td>1.86</td>
<td>42.95</td>
<td>0.000***</td>
</tr>
<tr>
<td>MDA (nmol/L)</td>
<td>2.91±0.67</td>
<td>8.40±2.18</td>
<td>5.49</td>
<td>185.55</td>
<td>0.000***</td>
</tr>
<tr>
<td>TAC (mmol/L)</td>
<td>1.94±0.16</td>
<td>1.30±0.20</td>
<td>0.64</td>
<td>37.98</td>
<td>0.000***</td>
</tr>
<tr>
<td>Zinc (µg/dl)</td>
<td>118.11±29.43</td>
<td>92.75±20.14</td>
<td>25.36</td>
<td>21.47</td>
<td>0.000***</td>
</tr>
<tr>
<td>Copper (µg/dl)</td>
<td>106.19±18.37</td>
<td>88.01±20.92</td>
<td>18.18</td>
<td>17.00</td>
<td>0.000***</td>
</tr>
<tr>
<td>TC (mg/dl)</td>
<td>170.68±23.87</td>
<td>305.90±63.00</td>
<td>135.22</td>
<td>79.22</td>
<td>0.000***</td>
</tr>
<tr>
<td>TG (mg/dl)</td>
<td>90.69±28.89</td>
<td>267.68±69.63</td>
<td>176.99</td>
<td>195.15</td>
<td>0.000***</td>
</tr>
<tr>
<td>HDL-C (mg/dl)</td>
<td>48.35±11.16</td>
<td>44.00±07.00</td>
<td>4.35</td>
<td>8.99</td>
<td>0.001***</td>
</tr>
<tr>
<td>LDL-C (mg/dl)</td>
<td>104.19±26.52</td>
<td>208.36±61.42</td>
<td>104.17</td>
<td>100.00</td>
<td>0.000***</td>
</tr>
</tbody>
</table>

*** Extremely significant, ** highly significant.

### Table 2. Comparison of all diagnosed biochemical parameter in Control and group 2 with SSNS.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Control</th>
<th>Group 2</th>
<th>Difference</th>
<th>% change</th>
<th>p-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Albumin (gms/dl)</td>
<td>4.33±0.33</td>
<td>3.44±0.48</td>
<td>0.99</td>
<td>20.55</td>
<td>0.000***</td>
</tr>
<tr>
<td>MDA (nmol/L)</td>
<td>2.91±0.67</td>
<td>5.12±1.98</td>
<td>2.21</td>
<td>75.94</td>
<td>0.000***</td>
</tr>
<tr>
<td>TAC (mmol/L)</td>
<td>1.94±0.16</td>
<td>1.67±0.24</td>
<td>0.27</td>
<td>13.91</td>
<td>0.000***</td>
</tr>
<tr>
<td>Zinc (µg/dl)</td>
<td>118.11±29.43</td>
<td>117.25±20.94</td>
<td>0.086</td>
<td>0.72</td>
<td>0.243NS</td>
</tr>
<tr>
<td>Copper (µg/dl)</td>
<td>106.19±18.37</td>
<td>101.37±17.24</td>
<td>4.82</td>
<td>4.53</td>
<td>0.055NS</td>
</tr>
<tr>
<td>TC (mg/dl)</td>
<td>170.68±23.87</td>
<td>270.37±44.26</td>
<td>99.69</td>
<td>58.40</td>
<td>0.000***</td>
</tr>
<tr>
<td>TG (mg/dl)</td>
<td>90.69±28.89</td>
<td>142.80±23.26</td>
<td>52.11</td>
<td>57.45</td>
<td>0.000***</td>
</tr>
<tr>
<td>HDL-C (mg/dl)</td>
<td>48.35±11.16</td>
<td>46.61±6.56</td>
<td>1.74</td>
<td>3.59</td>
<td>0.175NS</td>
</tr>
<tr>
<td>LDL-C (mg/dl)</td>
<td>104.19±26.52</td>
<td>195.19±44.41</td>
<td>91.00</td>
<td>97.34</td>
<td>0.000***</td>
</tr>
</tbody>
</table>

*** Extremely significant, ** highly significant, NS Insignificant.

### Table 3. Comparison of all diagnosed biochemical parameter in group 1 and group 2 with SSNS.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Group 1</th>
<th>Group 2</th>
<th>Difference</th>
<th>% change</th>
<th>p-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Albumin (gms/dl)</td>
<td>2.47±0.57</td>
<td>3.44±0.48</td>
<td>0.97</td>
<td>28.27</td>
<td>0.000***</td>
</tr>
<tr>
<td>MDA (nmol/L)</td>
<td>8.40±2.18</td>
<td>5.12±1.98</td>
<td>3.28</td>
<td>39.04</td>
<td>0.000***</td>
</tr>
<tr>
<td>TAC (mmol/L)</td>
<td>1.30±0.20</td>
<td>1.27±0.24</td>
<td>0.03</td>
<td>28.46</td>
<td>0.000***</td>
</tr>
<tr>
<td>Zinc (µg/dl)</td>
<td>92.75±20.14</td>
<td>117.25±20.94</td>
<td>24.5</td>
<td>26.41</td>
<td>0.000***</td>
</tr>
<tr>
<td>Copper (µg/dl)</td>
<td>86.01±20.92</td>
<td>101.37±17.24</td>
<td>13.36</td>
<td>15.18</td>
<td>0.000***</td>
</tr>
<tr>
<td>TC (mg/dl)</td>
<td>305.90±63.00</td>
<td>270.37±44.26</td>
<td>35.53</td>
<td>11.51</td>
<td>0.000***</td>
</tr>
<tr>
<td>TG (mg/dl)</td>
<td>267.68±69.63</td>
<td>162.80±23.26</td>
<td>124.88</td>
<td>46.65</td>
<td>0.000***</td>
</tr>
<tr>
<td>HDL-C (mg/dl)</td>
<td>44.00±07.00</td>
<td>46.61±6.56</td>
<td>2.61</td>
<td>5.93</td>
<td>0.006***</td>
</tr>
<tr>
<td>LDL-C (mg/dl)</td>
<td>208.36±61.42</td>
<td>195.19±44.41</td>
<td>13.17</td>
<td>6.32</td>
<td>0.077NS</td>
</tr>
</tbody>
</table>

*** Extremely significant, ** highly significant, NS Insignificant.
4. Discussion

Dyslipidemia is a contributory factor in the progression of initial glomerular injury in NS [10]. In the present study significantly increased mean serum levels of TC, LDL-C, TG and significantly decreased level of HDL-C in group 1 was observed when compared to healthy control, although dyslipidemia is a common complication of NS. The increased level of serum TC could be attributed to impaired metabolism of mevalonate by the nephrotic kidney. This allows a greater cholesterol availability that coupled with an enhanced Hydroxyl Methyl Glutaryl-CoA (HMG-CoA) reductase activity leads to increased hepatic cholesterol synthesis and unbalanced lipid homeostasis [10]. HDL-C is an effective antioxidant with the capacity to inhibit oxidative modification of LDL-C. HDL-C also possesses anti-inflammatory properties. These antioxidant and anti-inflammatory properties of HDL-C may be as important as its cholesterol efflux function in terms of protecting against development of atherosclerosis [11].

In our study we also found that serum MDA level was increased in group 1 as compared to healthy control and serum TAC, Copper and Zinc was significantly decreased in group 1 as compared to healthy control. These findings are corroborating with the finding of previous studies [12, 13, and 10]. Elevated plasma MDA level in nephrotic syndrome is strongly associated with the severity of nephrotic syndrome and renal injury [14]. Zinc deficiency was probably a consequence of reduced absorption of Zinc in conjunction with excessive urinary loss [15]. Nephrotic Syndrome patients may be associated with excretion of Ceruloplasmin a protein, which is normally not found in urine. Urinary copper loss is in direct proportion to the amount of Proteinuria [16]. Both ceruloplasmin and copper levels decrease in nephrotic syndrome patients [17]. Hypocupremia associated to Nephrotic syndrome is secondary to renal loss of copper proteins. Per-oxidation of lipid membrane raises the concentration of the MDA that results in lowering of the concentration of antioxidants because of consumption [4]. Albumin is a leading preventive but not a chain breaking antioxidant of serum. In the present study, significantly lower level of mean serum albumin was observed in group 1 in comparison with those of the healthy control. It is reported that even at very low concentration, albumin has a high antioxidant activity [12]. Mean serum levels of TAC significantly decreased in SSNS adults. These decreased levels suggest depletion, possibly because of consumption for neutralizing excessive circulating oxidants [13].

In present study we observed normalization of serum Zinc, Copper and HDL-C level in group 2 after the use of corticosteroid induction therapy. There was no normalization in serum level of TC, TG, LDL-C, MDA, and TAC in group 2 however, despite the use of corticosteroids. These findings are in agreement with previous study [18]. From our study and considering the results of some other experimental studies it is believed that steroids directly or indirectly impair the antioxidant reactions and lead to over production of reactive oxygen species (ROS). The use of antioxidant therapy in NS opens a promising field in prevention of oxidative stress-related pathologies in renal patients. Vitamin C, E and also combination magnesium, Zinc, Vitamin C and E supplements was effective in improvement of glomerular but not tubular renal function in type 2 diabetes patients [19]. The beneficial effects of antioxidants, minerals and B-complex vitamins on oxidative stress in Nephrotic Syndrome patients was also reported by Dwivedi et al. [7].

5. Conclusion

The findings of the present study display an increased oxidative stress and decreased antioxidant response in SSNS adults. Additionally, although there is clinical remission no normalization of the biochemical indices was observed despite the use of corticosteroids. Therefore, there might be a potential role for regular lipid monitoring during the follow-up of Nephrotic patients to identify high-risk patients, who should be evaluated for cognitive therapy. Therefore, the present study recommends the combined use of steroid, antioxidant therapy, and lipid lowering therapy in such adults to prevent development of NS related complications with more frequently and long term follow up in large number of patients would be necessary.

Acknowledgements

We sincerely thankful to Dr. S.L. Garg, Principal, and Prof. R.S. Maheshwari, HOD Biochemistry, Govt. Holkar Science College Indore (M.P.) for providing necessary laboratory facilities and encouragement.

6. References


EVALUATION OF SERUM ZINC AND COPPER LEVELS IN NEPHROTIC SYNDROME SUBJECTS

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ABSTRACT - Present Paper describes the effect of Proteinuria on serum Zn and Cu level in 75 patients with nephrotic syndrome aged 15-65 years against 50 properly matched controls. The results revealed that there is significant decrease in serum Zn and Cu level in Nephrotic subjects, compared to that of control (106.35µg/dl±21.34) & p value being <0.0001. Serum Cu level is also decreased significantly, (72.57µg/dl±16.70) in Nephrotic subjects compared to that of controls (119.28 µg/dl±18.69) p value being <0.0001. The etiology of zinc deficiency in nephrotic syndrome is unclear and may involve multiple mechanisms. A mechanism to account for the hypozincemia in nephrotic syndrome have been proposed, including concomitant nutritional deficiency with decreased oral zinc intake, decreased intestinal absorption or increased intestinal secretion of zinc all may contribute to altered zinc metabolism. The alteration in copper metabolism is more intense than those in Zinc metabolism. Serum zinc and copper levels determination can be of diagnostic value in nephrotic syndrome subjects.

KEY WORDS - Nephrotic Syndrome, Zinc, Copper, Hypoalbuminemia, Proteinuria

INTRODUCTION

Term nephrotic syndrome describes the clinical state characterized by the presence of Proteinuria, Hypoalbuminemia and edema.(Cameron et al.,1988) Copper and zinc physiology is considered a matter of great interest because of the possibility of being able to activate many key enzymes in the cellular metabolism. Copper and zinc are essential nutrients, and their daily intake is necessary to prevent diseases (World Health Organisation, 1996). They are constituents of the superoxide-dismutase enzyme, which performs intracellular antioxidant functions (Tuncer, et al., 1999). Copper is a constituent of ceruloplasmin, a powerful extracellular antioxidant enzyme (Halliwell, et al., 1990). The anti-inflammatory effects of copper and zinc have been documented in animals (Milanino, et al., 1988) and in humans (Milanino, et al., 1993). On the other hand, the acute or chronic inflammation induces metabolic alterations of these minerals as well as triggering other nutritional impairments (Gomez-Vaquero, et al., 2001). However, there are few studies about the copper and zinc serum levels in nephrotic syndrome subjects.

MATERIALS AND METHODS

The study was carried out on 75 patients with nephrotic syndrome patients aged 15-65 years against 50 properly matched controls randomly selected from society. The diagnosis of Nephrotic Syndrome was based on Proteinuria. Fasting venous Blood sample collected and allowed to clot for 20-30 minute. Serum was separated by centrifugation at 37 °C and used for estimation of biochemical parameters and stored at -20°C. Serum Zinc level was estimated by the Method of 5-Br-PAPS given by (Akita, 1989) Serum copper was estimated by 5-Br-PADAP method given by (Ventura and King, 1951) and serum albumin was estimated by Bromocresol green method. (Doumas, et al., 1971).

Statistical Analysis: All the values are expressed as mean ± SD. P-value is calculated to know whether change is significant or not. Coefficient of correlation is calculated between (I) Serum albumin vs. Zinc in controls (II) Serum Albumin vs. Zinc, in nephrotic syndrome patients (II) Serum albumin vs. Copper in controls (IV) Serum Albumin vs. copper, in nephrotic syndrome patients.

RESULTS

In our study nephrotic patients belonged to the age group of 15-65. Among 75 nephrotic patients 50 were males: 25 were females as shown in table 1. Among 50 control 32 were males and 16 were females. Mean age of the control and nephrotic syndrome patients was found to be 34±18.5 years and 32.6±22.4 years respectively. However age was not statistically significant. The mean BMI of the nephrotic syndrome patients was 18.12±2.8 and of the control was 19.5±3.6, and was not found statistically significant.

Table 2 shows serum albumin, Zinc and copper level in nephrotic syndrome patients as well as in control. The mean ± SD levels of albumin in the serum of nephrotic syndrome patients and controls were found to be 2.9±0.4.
gms/dl and 3.8±20 gms/dl respectively and found to be statistically significant (p<0.0001). The mean ± SD levels of Zinc in the serum of nephrotic syndrome patients and controls were found to be 74.57±12.72 mg/dl and 106.36±21.34 mg/dl respectively and found to be statistically significant (p<0.0001). The mean ± SD levels of copper in the serum of nephrotic syndrome patients and controls were found to be 72.57±16.70 mg/dl and 119.28±18.69 mg/dl respectively and found to be statistically significant (p<0.0001).

Correlation-Coefficients (r) in controls between Serum Zinc and albumin=0.35 and it was not statistically significant.

Correlation-Coefficients (r) in nephrotic syndrome patients between Serum Zinc and albumin =0.5437 and found to be statistically significant.

Correlation-Coefficients (r) in controls between Serum Copper and albumin=0.3912 and was not statistically significant.

Correlation-Coefficients (r) Nephrotic syndrome patients between Serum Copper and albumin =-0.6241 and found to be statistically significant.

Correlation-Coefficients (r) in nephrotic syndrome patients and controls were found to be statistically significant (p<0.0001). The mean ± SD levels of copper in the serum of nephrotic syndrome patients and controls were found to be 72.57±16.70 mg/dl and 119.28±18.69 mg/dl respectively and found to be statistically significant (p<0.0001).

DISCUSSION

Several investigators studied zinc & copper metabolism of patient with nephrotic syndrome. Serum level of zinc and copper mostly found below normal values. Our results confirm these observations. Ceruloplasmin is a copper-containing serum globulin. Ninety-five per cent of the total copper content of the serum is bound to ceruloplasmin. Nephrotic Syndrome patients may be associated with excretion of Ceruloplasmin a protein, which is normally not found in urine and urinary copper loss, is in direct proportion to the amount of Proteinuria (Sanjye, et al., 1991). Both ceruloplasmin and copper levels decrease in nephrotic syndrome patients (Herbert, 2003). Although the copper binding protein ceruloplasmin is lost in the urine in Nephrotic Subject and its level are low in plasma and red cell, copper concentration are usually normal (Predraza, et al., 1994). Hypocupremia is associated to Nephrotic syndrome secondary to renal loss of copper proteins. Ceruloplasmin in bound copper likely plays a significant role in predisposing patient with nephrotic syndrome to copper deficiency (Reichel, et al., 1992). The most important Zinc binding protein in serum is albumin. Zinc level were reduce in parallel with serum total protein, serum albumin, but serum copper levels on the other hand reduce not as much as zinc(Lindeman, et al., 1990). Most of the serum Zn is normally bound to circulating proteins. Low serum Zn concentrations might result from depletion of Zn-binding proteins. Serum proteins and Zn concentrations have been reported to be depressed in patients with acute and chronic diseases. The element Zn is the metal component or activator of many important enzymes. The tissue concentrations and activities of Zn metalloenzymes direct the rate of protein and nucleic acid synthesis, thereby influencing tissue growth and repaerative process. Nephrotic Syndrome documented zinc deficiency was probably a consequence of reduced absorption of Zinc in conjunction with excessive urinary loss (Stek, et al., 1990). Zinc circulate mainly bound to albumin and also in transferring and thus the reduced zinc concentration in plasma, hair & white cells in Nephrotic subjects is not surprising (Herbert, 2003) Over 90% of serum Zinc is bound to protein in normal subject Though the correlation between serum zinc albumin concentration is unimpresssive The low serum zinc concentration in the patient with nephrotic syndrome does not appear due to loss of zinc bound urinary protein (Lindeman, et al., 1990). A linear correlation was found between Proteinuria and urinary zinc and copper in relapse of nephrotic syndrome (Stek, et al., 1990). Several studies have demonstrated increased urinary losses of zinc which may occur despite high oral zinc intake, in patients without proteinuria suggesting that alteration in renal tubular excretion or reabsorption of zinc may contribute to increased urinary Zinc losses in patients with nephrotic syndrome (Stek, et al., 1990; Mahajan, et al., 1985 and Perrone, et al., 1990).

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Nephrotic Syndrome Patients (n=75)</th>
<th>Controls (n=50)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>NO (M/F)</td>
<td>50:25</td>
<td>34:16</td>
<td>NS</td>
</tr>
<tr>
<td>Age (Years)</td>
<td>32.6±22.4</td>
<td>34.2±18.5</td>
<td>NS</td>
</tr>
<tr>
<td>BMI (Kg/m²)</td>
<td>18.12±2.8</td>
<td>19.5±3.6</td>
<td>NS</td>
</tr>
</tbody>
</table>

P-Values are no significant.

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Nephrotic Syndrome Patients</th>
<th>Controls</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Albumin (gms/dl)</td>
<td>2.9±42</td>
<td>3.8±20</td>
<td>&lt;.0001*</td>
</tr>
<tr>
<td>Zinc (mg/dl)</td>
<td>74.57±12.72</td>
<td>106.36±21.34</td>
<td>&lt; .0001*</td>
</tr>
<tr>
<td>Copper (mg/dl)</td>
<td>72.57±16.70</td>
<td>119.28±18.69</td>
<td>&lt; .0001*</td>
</tr>
</tbody>
</table>

P-Values are Highly significant.
REFERENCES


TOTAL ANTIOXIDANT CAPACITY OF NEPHROTIC SYNDROME SUBJECT

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ABSTRACT: The prevalence and pattern of renal disease vary widely in different geographical regions of the world. The prevalence of Nephrotic Syndrome (NS) is 60 to 100 times greater in the tropical region than in the United States or United Kingdom. This is possibly related to the environmental nephrogenic agent not seen in the temperate climates. The syndrome is characterized by heavy proteinuria (>3.5 gm/day), hypoalbuminaemia and hypercholesterolemia. Nephrotic Syndrome is associated with an increased risk coronary heart disease. Total antioxidant capacity may reduce because of hypoalbuminaemia and hyperlipidaemia. We studied 60 subjects with Nephrotic Syndrome and 50 age and sex matched healthy non proteinuric controls. Serum total antioxidant capacity (TAC) was significantly lower in Nephrotic Syndrome subjects as compared with controls. Serum total antioxidant capacity of NS subjects found to be 1.73±0.18 m mol/l and that of control s 2.04±0.2 m mol/l.

This study demonstrates that in the NS subjects there is decrease in total antioxidant capacity of serum with hypoalbuminaemia and hyperlipidaemia. It may contribute to the increased risk of cardiovascular disease as seen in Nephrotic Syndrome subjects.

KEY WORDS: Nephrotic Syndrome, Hypoalbuminaemia, Hyperlipidaemia, Total Antioxidant Capacity.

INTRODUCTION

Nephrotic Syndrome (NS) is not a disease but it is a group of symptoms. It is characterized by heavy proteinuria (>3.5 gm/day) associated with peripheral oedema, hypoalbuminaemia and hyperlipidaemia (Cameron et al., 1998) and an increased risk of coronary heart disease (Ordonez et al., 1993). Elevated plasma low density lipoprotein (LDL) cholesterol is likely to contribute to this increased cardiac risk (Kannel et al., 1971). However hypoalbuminaemia is also independently associated with increased risk of cardiovascular (Phillips et al., 1989) disease, possibly by increasing oxidant stress.

Albumin is a non enzymatic protein antioxidant that inhibits LDL peroxidation in vitro (Dobrian A et al., 1993). Hypoalbuminaemia is associated with endothelial dysfunction (Gwinner et al., 2000).

In this study we compared Total Antioxidant Capacity (TAC) of (NS) subjects with that healthy non proteinuric control to test the hypothesis that oxidant stress is increased in NS as a consequence of hypoalbuminaemia and hyperlipidaemia.

SUBJECTS & METHODS

60 patients aged 35 to 65 years who had Nephrotic range proteinuria (>3.5 gm/day) with a primary glomerular disorder were recruited from renal clinics over a six month period. Patient with serum Creatinine >150(µmol/l), diabetes mellitus, malignancy and other history of disease were excluded. 50 healthy controls matched for age, sex and body mass index (BMI) were recruited from the community. All volunteers gave written consent and the ethical committee of MY hospital and groups approved the study.

STUDY DESIGN & LABORATORY METHODS:

The study was a cross sectional comparison of NS and control subjects. Blood pressure was measured by using Sphygmomanometer (diamond company).

Venous blood samples were obtained after a 12 hr fast for the following variables which were
measured by standard laboratory methods. TC, TG and HDL-C were estimated by using commercial kits manufactured by sigma diagnostics. LDL cholesterol was measured by using the modified Fridewald formula (Fridewald WT et al., 1972) except if TG level > 4.5 m mol/l. Serum albumin was measured by bromocresol green method (Bartholomew, R.J. et al., 1966), Creatinine by Jaffe's reaction (Brod, J. et al., 1948), bilirubin and uric acid were measured by using commercial kit. We measured serum antioxidant capacity by Koracevic et al., (2001) method, based on the assay measured the capacity of biological fluids to inhibit the production of Thiobarbituric acid reactive substances (TBARS) from Sodium Benzoate under the influence of free oxygen radicals.

**Statistical Analysis:** Results are expressed as mean ± SD (Standard Deviation). Student’s T-test was used between groups, for comparison.

**RESULTS**

The clinical profile of the nephrotic subjects and control groups are shown in table 1 and biochemical characteristics of the nephrotic and control subjects are shown in table 2.

**Table 1: Demographic data of the studied group**

<table>
<thead>
<tr>
<th>Character</th>
<th>NS</th>
<th>Controls</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>46 ± 15.6</td>
<td>45.8 ± 13.2</td>
</tr>
<tr>
<td>BMI (Kg/m²)</td>
<td>26.2 ± 3.9</td>
<td>25 ± 3.1</td>
</tr>
<tr>
<td>SBP (mm Hg)</td>
<td>125 ± 16.2</td>
<td>112 ± 12</td>
</tr>
<tr>
<td>DBP (mm Hg)</td>
<td>70 ± 8.2</td>
<td>68 ± 8</td>
</tr>
</tbody>
</table>

![Demographic data of the studied group](image-url)
Table 2: Biological characteristics of the studied group

<table>
<thead>
<tr>
<th>Biological Parameter</th>
<th>NS (n=60)</th>
<th>Controls (n=50)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serum Albumin (g/l)*</td>
<td>31 ± 4.3</td>
<td>43.7 ± 4.9</td>
</tr>
<tr>
<td>Serum Creatinine (µmol/l)***</td>
<td>124.2 ± 4.6</td>
<td>82.4 ± 3.9</td>
</tr>
<tr>
<td>Serum TAC (m mol/l)**</td>
<td>1.73 ± 0.18</td>
<td>2.04 ± 0.2</td>
</tr>
<tr>
<td>TG (m mol/l)*</td>
<td>3.6 ± 1.3</td>
<td>1.2 ± 0.32</td>
</tr>
<tr>
<td>TC (m mol/l)*</td>
<td>11.4 ± 2.1</td>
<td>4.6 ± 0.46</td>
</tr>
<tr>
<td>LDL-C (m mol/l)*</td>
<td>8.3 ± 1.6</td>
<td>2.9 ± 0.32</td>
</tr>
<tr>
<td>HDL-C (m mol/l)***</td>
<td>1.3 ± 0.28</td>
<td>1.2 ± 0.2</td>
</tr>
<tr>
<td>Serum Uric acid (m mol/l)*</td>
<td>0.45 ± 0.12</td>
<td>0.29 ± 0.17</td>
</tr>
<tr>
<td>Serum Bilirubin (µmol/l)*</td>
<td>10.1 ± 2.8</td>
<td>15.1 ± 3.2</td>
</tr>
</tbody>
</table>

Note: Values are mean ±SD of no of observation (n).
* indicates P<0.0005,
** indicates p<0.01
*** indicates not significant
As expected NS group had, statistically higher TC (total cholesterol) and TG (triglyceride) and LDL-cholesterol level and a significantly lower serum albumin as compared with controls. In the NS group serum uric acid was significantly higher and serum bilirubin was significantly lower.

The scientific community is now well aware of the role of antioxidant in protecting subjects from the damage caused by free radicals, there by helping in checking the progression of disease. When the total antioxidant capacity of the NS subjects (1.73±0.18) was compared with controls, it showed that the normal subjects had significantly higher levels of antioxidant capacity (2.04 ± 0.2 m mol/L).

**DISCUSSION**

Defence against free radical mediated oxidative damage consists of antioxidative enzymes and the free radical scavengers such as albumin (McCord JM et al 1993). In nephrotic subjects decreased total antioxidant capacity (TAC) values represent a decreased ability to trap free radical that is positively correlated with serum albumin in response to reduced antioxidant defense. One may expect increased evidence of oxidative damage and changes to the cellular components of the glomerulus (Gwinner et al 2000).

The lipid disorder in our nephrotic patients was a mixed hyperlipidaemia and increase in per oxidative damage may be a long term consequence of sustained hypercholesterolemia.

Bilirubin a water soluble antioxidant was significantly lower in nephrotic syndrome subjects, reflecting reduction in albumin bound unconjugated bilirubin.

Uric acid another water soluble antioxidant was significantly elevated in NS patients, although hyperuricaemia is considered as the marker of the cardiovascular risk. (1 Wannamethes SG et al 1999).

Bulucu F, Vural A et al 2003 studied oxidative stress status in adults with nephrotic syndrome; results obtained support the previous data indicating an abnormality in antioxidative system of nephrotic patients.

However, plasma markers of actual peroxidative damage were not increased (Gursharan Dogra, Natalie Ward et al 2008).
CONCLUSION

This study provides evidence for decreased antioxidant defense in NS and this may primarily be a consequence of hypoalbuminemia. Decrease total plasma antioxidant capacity (TAC) in association with hyperlipidaemia may contribute to the progression of coronary artery disease and glomerulopathy in NS.

REFERENCES


HYPOCITRURATURIA IN PATIENTS WITH UROLITHIASIS

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2 Dr. Ulhas Patil Medical College, Jalgaon
3 P.D. Medical College, Amravati

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Objective: To determine urinary citrate excretion in patients with urolithiasis and normal controls. A Prospective Study was conducted at ACPM Medical college, Dhule.

Methods: This study was carried out on 100 normal individuals and 100 kidney stone patients (76 males and 24 females) with idiopathic urinary calculi. A 24-hour age and weight matched control was also included.

Results: Urinary citrate was estimated in a 24-hour urine sample using colorimetric method. The stones removed from these Patients were also analysed. Results: There was a preponderance of urinary stones in males; the highest incidence being in Group 2. Excretion of citrate in 24-hour urine sample was significantly lower in patients compared to controls, for males in all age groups and for females. However, there was no statistically significant difference in the urinary citrate value between males and females in a given age group for either controls or patients. The urinary citrate excretion increased with age in patients and controls, but the levels in patients were lower. Depending upon the constituents, four types of stones were identified, calcium phosphate, calcium oxalate, uric acid and magnesium ammonium phosphate. Forty six stones had at least one major constituent. Hypocitraturia was detected in 93% with urinary stones in patients, especially in endemic areas.

Conclusion: Urinary citrate excretion should be determined in all patients with urolithiasis.

STUDY OF HOMOCYSTEINE, TOTAL ANTIOXIDANT CAPACITY, LIPOPROTEINS, ZINC AND COPPER IN STE-ROID SENSITIVE NEPHROTIC SYNDROME PATIENTS.

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Key words: Malondialdehyde, Total antioxidant capacity, Hyperhomocysteinemia, Remission, Nephrotic syndrome.

Several cardiovascular risk factors present in patients with nephrotic syndrome among which are systemic
ABNORMAL LIVER FUNCTION TEST IN SCRUB TYPHUS IN PEDIATRIC AGE GROUP

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Dr Himesh Barmania#

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ABSTRACT:

A MULTIVARIATE ANALYSIS OF ASYMMETRIC DIMETHYLARGININE (ADMA) LEVELS IN CHRONIC KIDNEY DISEASE (CKD).

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Methodology: Scrub typhus cases were diagnosed by clinical features and positive Weil-Felix test with OXK titre≥1:80 and/or OX19K ≥1:160. Blood and CSF of 24 such paediatric cases, attending North Eastern Indira Gandhi Regional Institute of Health and Medical Sciences, Shillong was analysed for Liver function Tests (Total Bilirubin, ALT, ALK, Phosphatase, Total Protein & Albumin), Renal function tests (Urea, Creatinine), and Serum Electrolyte levels (Na+/K+).

Results: The mean age of the patients was 9yrs (range 2-18yrs) with 13 (54.2% mean age 10yrs) males and 11(45.8%, mean age 9yr 2 month) females. One or more parameter of Liver function tests was abnormal in 15(63%) cases out of which 14(58%) cases have raised ALT (105±49 IU/L, Range 51-204 IU/L), 14(58%) cases have raised AST(178±50 IU/L, Range 61-626 IU/L), 11(46%) cases had hypoalbuminemia (2.58±0.24g/dl, Range 2.1-2.9 g/dl), 12(50%) cases had increased Alkaline phosphatase (794±588 IU/L, Range 247-1863 IU/L) and 2(1%) cases have mildly raised Total bilirubin and all of them was associated with serious complications including meningencephalitis, coagulopathy, seizures, congestive cardiac failure, cortical blindness etc. None of the cases had any abnormality in renal function as well as serum glucose level. Transient hyponatremia was present in 16 cases but there was no correlation with severity of the disease or its complication and responded promptly to the therapy.

Conclusion: Hepatic dysfunction is common in children with scrub typhus. Increased AST, ALT, Alkaline Phosphatase and hypoalbuminemia closely related with the complications of the disease.
Phosphatase Activity In Various Tissues Of Philosamia Ricini Larvae Due To Cholesterol Residue

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Department of Biochemistry, University of Allahabad, Allahabad

Introduction: The present study was designed to investigate that certain sterols have brain hormone activity & Juvenile hormone activity in insect. The molting hormone of the silkworm has been shown to have a steroid structure. However, Most insects apparently lack the capacity for the biosynthesis of the steroid nucleus & therefore show a dietary requirement for sterols. Hence, the dietary supplements of cholesterol to the worm causes many physiological effects on different tissues like haemolymph, silk gland, fat bodies, Intestine of silkworms. Cholesterol plays important role in histological and histochemical reactions, is that occur in the hardening and tanning process that occur in the insect cuticle immediately following moulting. It is suggested that the sterol is secreted via the pore canals to the new exocuticle where some form of interaction between protein, sterol and phenolic substances takes place. Another function attributed to Cholesterol was transported in the haemolymph and incorporated into the fat body. Cholesterol also plays most important role in membrane structure and permeability. Cholesterol serves as the precursor of the insect molting hormone ecdysteroids. The P. ricini of the Lepidoptera order undergoes metmorphosis from larva to imago.

Material and method: An experiment was carried out to evaluate the effect of cholesterol on silkworm, Philosamia ricini. Castor leaves were sprayed with varying concentrations of Cholesterol have area concentration of 2-3mg/m2 were fed to silkworm larvae in the 1st day after 4th molting. Biochemical changes in activity of acid and alkaline Phosphatase in various tissues of different days of 5th instar stages were measured.

Result: The results showed that in 72 h after using toxic leaves, the activity of both phosphatases show slight deviation from the control. These compounds after 120 h had different fluctuations in various tissues like haemolymph, silk gland, fat bodies and intestine. The random doses of cholesterol in P. ricini diet interrupt larval feeding and normal growth. High mortality of larvae occurs during molting and they do not complete this process normally. Also the larvae exhibit hyper-sensitivity and the symptoms such as immobility dyspepsia, darkening of the skin, inability to excrete normally exciting brownish fluid from anus and swelling of rectal muscles. Larval weights upon treatments were increases in 24 to 72 hrs while decreases by feeding of 120hrs.

Conclusion: Cholesterol feeding also affects the metamorphosis of the worms. It gives imminence effect on the duration of cocoon formation. It takes 2-3 days more to spin into cocoon as compared to control. This shows imbalance of hormones like Juvenile hormone and ecdysteroids hormone. The phosphatase activity in various tissues of P. ricini gives significant results that show pronounced change in the various metabolite as well as hormonal changes. Therefore it was considered interesting and worthwhile to investigate the enzymatic activities in the insect of industrial importance.

Total Antioxidant Capacity In Relation To Dyslipidemia In Nephrotic Patient During Remission

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Objective: - It has been Proposed that Nephrotic Syndrome (NS) is a consequence of imbalance between oxidant & antioxidant status. The present study aimed to assess Total Antioxidant Capacity (TAC) in relation to Dyslipidemia in Nephrotic patient during remission.

Material & Method: - A descriptive study was carried out. A total of eighty NS subjects were included in study group, which were on treatment with prescription of regular dose of 40-mg/day sinvastatin & 500mg/day Ascorbate tablets. We measured lipid per oxidation & TAG before & after treatment for 90 days.

Result: - Serum Total Cholesterol (TC) is 495±159 mg/dl Vs. 243±39 mg/dl, P< .005 Triglyceride (TG) is 218±67 mg/dlVs. 130±82 mg/dl, P< .005 LDL-Cholesterol is 267±120 mg/dl Vs. 138±128 mg/dl, P< .005 VLDL-Cholesterol is 30±4 mg/dl Vs. 19±5 mg/dl, P< .05 Malondialdehyde (MDA) is 8.99±.58 mg/dl Vs. 3.22±.47 mg/dl, P< .005 TAC-1.02±0.12 mmol/L Vs. 1.4±0.39 mmol/L, P< .005 These changes were significant after 3 months of therapy.

Conclusion: - In NS patient serum lipid level & there per oxidation is normalized due to combined & synergic action of lipid lowering drug sinvastatin & Vitamin-C Antioxidant.
EVALUATION OF SERUM ZINC & COPPER LEVEL IN NEPHROTIC SYNDROME SUBJECT

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Background: Nephrotic Syndrome is characterized by heavy Proteinuria, Hypoalbuminemia, edema Hypercholesterolemia & normal renal function. About 2/3rd of Plasma zinc is bound to albumin & abnormalities of Zn metabolism are well-documented in patient with chronic renal disease, especially those with nephrotic disease. Urine Cu and Zn showed a positive correlation with Urine total protein.

Method: Here we studied the effect of Proteinuria on serum Zn & Cu level in 75 patients with nephrotic syndrome aged 15-65 years against 50 properly matched controls.

Result: The result revealed that there is significant decrease in serum Zn level (74.57μg/dl±12.72) of Nephrotic subject, compared to that of control (106.35μg/dl±21.34) & p value < .05 Serum Cu level is also decreased significantly, (72.57μg/dl±16.70 of Nephrotic syndrome) compared to that of control (119.28 μg/dl±18.69) p value < .05.

Conclusion: The etiology of zinc deficiency in nephrotic syndrome is unclear and may involve multiple mechanisms. A mechanism to account for the hypozincemia in nephrotic syndrome have been proposed, including concomitant nutritional deficiency with decreased oral zinc intake, decreased intestinal absorption or increased intestinal secretion of zinc. The alteration in copper metabolism is more intense than those in Zinc metabolism. Demonstrating decreased serum zinc & copper levels can make a diagnosis of zinc & Copper deficiency.

EFFECT OF NEEM EXTRACT IN TYPE II DIABETIC PATIENTS

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2Department of Obst. & Gynaec., S.A.I.M.S., Indore
3Department of Biochemistry, M.G. Medical College, Indore

Objectives: Present study was carried out to evaluate the Blood glucose, HbA1C & LFT in Type II Diabetic patients and correlate these parameters with the disease process along with complications.

Methods: Sixty diabetic cases (Controlled and Uncontrolled) were studied. Nimbola capsules were given in dose of one capsule B.D. from 0 to 60 days to both study groups. The blood samples were collected on 0 day, 15th day, 30th day and 60th day, then capsules were withdrawn and again sample was collected after 15 days i.e. on 75th day.

Results: The mean FBS values of controlled diabetics on 0 day was 117.8mg/dl with S.D. 11.96. After giving Nimbola capsule for 60 days the mean FBS values on 15th, 30th & 60th days were 109.6 mg/dl with S.D. 9.6, 92 mg/dl with S.D. 6.56 & 94.33 mg/dl with S.D. 5.21 respectively. The mean FBS value on 75th day was 106.9 mg/dl with S.D. 8.77. On comparisons of values on 0, 15th, 30th, 60th & 75th days, it was found to be highly significant (p<0.001). The mean PPBS values of controlled diabetics were also found to be highly significant. (p<0.001). Similarly the mean FBS & PPBS values of uncontrolled diabetics from 0 to 75th days were found to be highly significant (p<0.001).
Smoking causes an increase in blood pressure, pulse rate, cortisol and aldosterone levels. Approximately 15% of hypertension is attributable to smoking. Smoking interferes with the metabolism of multiple antihypertensive medications and neutralizes their effectiveness. Hypertension and smoking are the two common mechanisms for generating oxidative stress and inflammation. In oxidative stress, the free radicals are over produced and the natural antioxidant system is weakened. Dietary nutraceuticals such as Vitamin C, E and polyphenolics are known to lower oxidative stress.

To evaluate the role of Vitamin C in lowering the oxidative stress, the present follow up study was carried out on 42 hypertensive males in the age group (25-64 years). They were compared with 22 age and sex matched normal healthy male individuals who served as controls.

All the subjects were evaluated for Lipid peroxidation product MDA and antioxidant enzyme SOD and catalase before and after the supplementation of Vitamin C tablet for 3 months. Before supplementation of Vitamin C, MDA level was found to be significantly elevated and SOD and catalase levels were found to be lowered (p<0.001) in all the subjects. After supplementation of Vitamin C for 3 months ( 500mg /day ); the MDA level was found to be lowered and SOD and catalase levels were found to be raised (p<0.05).

Current study suggests that lowering the oxidative stress with nutraceutical antioxidants like Vitamin C can be a health benefit.

TOTAL ANTIOXIDANT CAPACITY IN SERUM OF NEPHROTIC SYNDROME SUBJECTS

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**Department of Biochemistry, M.G.M. Medical College Indore (M.P) India.

ABSTRACT

The prevalence and pattern of renal disease vary widely in different geographical regions of the world. The prevalence of Nephrotic Syndrome (NS) is 60 to 100 times greater in the tropical region than in the United States or United Kingdom. This is possibly related to the environmental nephrogenic agent not seen in the temperate climates. The syndrome is characterized by heavy proteinuria (>3.5 gm/day), hypoalbuminaemia and hypercholesterolemia. Nephrotic Syndrome (NS) is associated with an increased risk coronary heart disease. Total antioxidant capacity may reduce because of hypoalbuminaemia and hyperlipidaemia. We studied 15 subjects with Nephrotic Syndrome (NS) and 15 age and sex matched healthy non proteinuric controls. Serum total antioxidant capacity was significantly lower in Nephrotic Syndrome(NS) subjects as compared with controls. Serum total antioxidant capacity of NS subjects found to be 1.73 ± 0.18 m mol/I and that of control is 2.04 ± 0.2 m mol/I. This study demonstrates that in the NS subjects there is decrease in total antioxidant capacity of serum with hypoalbuminaemia and hyperlipidaemia. It may contribute to the increased risk of cardiovascular disease as seen in Nephrotic Syndrome subjects.

Key Words:Nephrotic Syndrome, Hypoalbuminaemia, Hyperlipidaemia, Total Antioxidant Capacity.

EFFECT OF CURRY LEAVES (MURRAYA KOENIGII) FEEDING ON BLOOD SUGAR LEVEL OF NON-INSULIN DEPENDENT MIDDLE-AGED DIABETICS.

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ABSTRACT

Diabetes is in the top five of the most significant diseases in the world. In 2006, according to WHO at least 171 millions people world wide suffer from diabetes. Its incident is increasing rapidly & it is estimated that by year 2030 this number will be doubled. About 35 million people in India suffer with type –II Diabetes (adult diabetes). In a few years it could be as many 75 million. Type-II diabetes has increasingly become a problem in young people. The longer the person has diabetes the greater the chances of developing severe damage to eyes, nerves, heart, kidney & blood vessels.

Our present study was done on 50 million middle-aged non-insulin dependent diabetes mellitus patients. We supplemented 12 gm curry leaves powder for 1 month. The parameters were monitored at first day & thirty days were fasting & two hour post prandial sugar level & glycosylated Hb. The result indicated a transient reduction in blood sugar level & slight change in glycosylated heamoglobin after 30 days.