Steroid therapy and metabolic syndrome in patients with sarcoidosis

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Introduction

Sarcoidosis is granulomatous multisystem disease of unknown etiology. Granuloma formations frequently require steroid therapy.

The aim of this study is to analyze the influence of steroid therapy on metabolic impairments i.e. metabolic syndrome.

Materials and Methods

39 patients from the analyzed group had metabolic syndrome as defined by the Third National Health and Nutrition Examination Survey (NHANES). 129 patients were on high doses of steroid therapy (20mg/day), 32 patients were on morbostatic doses (5-10mg daily) and 27 patients were without steroid therapy.

Patients

1. Abdominal obesity: waist circumference >102 cm in men and >88 cm in women.
2. Hypertriglyceridemia: ≥150mg/dL (1.69 mmol/L).
3. Low high-density lipoprotein (HDL) cholesterol: <40 mg/dL (1.04 mmol/L) in men and <50 mg/dL (1.29 mmol/L) in women.
4. High blood pressure: ≥130/85 mmHg.
5. High fasting glucose: ≥110 mg/dL (≥6.1 mmol/L).

Results

**Figure 1.** TRG/HDL Ratio - metabolic syndrome and steroid dose

Statistically significant differences were found in lipid metabolism between sarcoidosis patients with metabolic syndrome and patients without metabolic syndrome. (F=26.29; df=1, 80; p<0.01).

**Table 2.** Descriptive statistics (variables: lipid metabolism, metabolic syndrome and steroid dose)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Gender</th>
<th>Mean</th>
<th>SD</th>
<th>N</th>
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<tbody>
<tr>
<td>HDL cholesterol (mmol/L)</td>
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<tr>
<td>Low</td>
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<td>High</td>
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<td>Triglycerides (mmol/L)</td>
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<td>Fasting glucose (mmol/L)</td>
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<td>Systolic blood pressure (mmHg)</td>
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<td>Diastolic blood pressure (mmHg)</td>
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<td>% fat</td>
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**Figure 2.** JFG (mmol/l) metabolic syndrome and steroid dose

Impaired fasting glucose (JFG) and metabolic syndrome

Statistically significant interaction was found between the doses of steroid therapy on glucose fasting. (F=5.32; df=4, 18; p<0.05).

Conclusions

Patients on high doses of steroid therapy with metabolic syndrome had significantly higher HDL cholesterol compared with patients without metabolic syndrome. (F=14.32; df=4, 8; p<0.05).

Statistically significant correlation were found in all variables related with lipid metabolism and metabolic syndrome.

No significant difference in glucose fasting between patients on high doses of steroid therapy and metabolic syndrome and patients without metabolic syndrome was found. (Figure 2).

Discussion

Statistical analyses

ANOVA (two ways) was used to analyze the coexistence (of any) of metabolic syndrome (glucose fasting) and the dose of steroid therapy, and for the analysis of the dose of steroid therapy (low high) and the effect on lipid metabolism (TRG/HDL Ratio, % fat, BMI, waist circumference) MANOVA two ways was used.

This small sample study revealed the existing interaction between metabolic syndrome and steroid therapy. This small sample study revealed the existing interaction between metabolic syndrome and steroid therapy. This small sample study revealed the existing interaction between metabolic syndrome and steroid therapy.

The possible explanation is that patients on high doses steroid therapy are physically active group of patients (no joint or muscle pains, stiffness), comparing to patients on low doses steroid therapy (the majority of them patients with chronic sarcoidosis).

The fact is that physical activity (exercise) enables better glucose metabolism and greater exploitation of fatty acids in their muscles. High doses steroid therapy (short time) seems to be good choice considering physical activity, high dose steroid therapy seems to be safe concerning metabolic syndrome impairments too.

Conclusion

The dose of prednisone therapy, but the therapy duration (long lasting steroid therapy with low doses) significantly correlates with the possibility of developing metabolic syndrome in sarcoidosis patients requiring long term treatment.

References