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# SHORT COMMUNICATION

## VARIATIONS IN SERUM PROTEIN FRACTIONS FOLLOWING A CONTINUOUS LONG TERM INTAKE OF EUGYNON AND LYNDIOL BY IRANIAN WOMEN

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### SUMMARY

Serum total protein, albumin and globulin fractions were estimated in 150 subjects in the reproductive stage of life, using lyndiol or eugynon for 1–72 months and results were compared with those obtained from 32 healthy subjects, of the same social class, who had never used oral contraceptives. There was no statistically significant variations observed in serum total protein and $\gamma$ globulin. Serum albumin decreased in 100% of the subjects, whereas $\alpha_1$, $\alpha_2$ and $\beta$ globulins increased in over 95% of the individuals.

### INTRODUCTION

Many investigators have so far shown that serum total protein and albumin fractions are both reduced following the administration of oestrogens or the use of combined contraceptive pills [1–8]. There has not been complete agreement in many reports dealing with variations observed in various electrophoretic globulin fractions. Using small number of subjects and short term administration of oral contraceptives Musa, Doe and Seal[5] did not find any statistically significant variations in globulin fractions. Robertson[8] found statistically significant increases in the values of $\alpha_1$ and $\beta$ globulins, but no significant variation in the value of $\gamma$ globulin. Horne, Howie, Weir and Goudie[9] found a significant rise in IgG (the main fraction of $\gamma$ globulin) following the use of ovulen and norinyl-1, and later Horne, Mallinson, Ferguson and Goudie[10] did not demonstrate any change in IgG, following the use of mestranol or ethynodiol diacetate. Finally Ramcharan, Sponzilli and Wingred[7] scanning a large number of subjects, regardless of the time following the intake of combined oral contraceptives demonstrated a statistically significant increase in $\alpha_1$, $\alpha_2$ and $\beta$ globulin and a decrease in $\gamma$ globulin fractions. Considering the vast use of oral contraceptives throughout the world, serum protein fractions warrant special consideration, all over the world, in view of their medical importance.

### MATERIALS AND METHODS

Serum total protein, albumin and globulin fractions were estimated by biuret method and electrophoresis on cellulose acetate in veronal buffer at pH = 8.9 with constant voltage, in a Shandon apparatus. Strips were rendered transparent and scanned in a Karl Zeiss scanner. Areas under the peaks were calculated from the integral.

Blood samples were collected between 0900 and 1100 h by venaepuncture, and sera were separated as soon as the clot was formed, centrifuged and kept at 4°C if necessary. All subjects were perfectly healthy, from the middle social class, attending the same family planning clinic in Tehran. They had no past history of severe illness.

### RESULTS

Serum total protein and protein fractions were estimated in 150 Iranian subjects, from 18–41 years of age, who had used lyndiol (mestranol 0.15 mg, lynoestrenol 2.5 mg), and eugynon (ethynyl oestradiol 0.05 mg, norgestrel 0.5 mg) for 1–72 months. These results were compared with those obtained from a control group of 32 Iranian ladies, from 18–41 years of age, from the middle social class who had never used oral contraceptives before.

Figure 1 shows a schematic diagram of serum total protein, and protein fractions following the intake of lyndiol for varying lengths of time, compared with control. Similar variations were observed following the intake of eugynon. The decrease shown in albumin fraction and the increases shown in $\alpha_1$, $\alpha_2$ and $\beta$ globulin fractions were statistically significant $P < 0.01$ or $P < 0.02$, but there was no statistically significant variation observed in the value of $\gamma$ globulin, following the intake of eugynon or lyndiol. There was no dose response correlation observed either.

### DISCUSSION

The statistically significant variations observed in $\alpha_1$, $\alpha_2$ and $\beta$ globulin fractions are in agreement with the findings of Robertson[8] concerning $\alpha_1$ and $\beta$ globulin fractions and that of Ramcharan *et al.*[7] concerning $\alpha_1$, $\alpha_2$ and $\beta$ globulin fractions. Ramcharan *et al.* also found a fall in $\gamma$ globulin fraction following the use of combined oral contraceptives in a large number of subjects, and report that the inability of previously finding any statistically significant variations in the level of globulin fractions has been due to small number of investigations. This is yet another study, that although performed on a rather large number of subjects, following a long term administration of combined oral contraceptives, no statistically significant change has been observed in $\gamma$ globulin value and thus supports the previous findings of Robertson[8] Musa *et al.*[5] and Horne *et al.*[9] in this respect. The decrease in the value of albumin, and the increases observed in the values of $\alpha_1$, $\alpha_2$ and $\beta$ globulins were due to a similar change observed in all the women studied. There did not seem to be any significant difference in the variations observed following the intake of lyndiol or eugynon. There was not a dose response corelation observed either. Attention should also be directed towards the fact that using progestogen only oral contraceptives Laurell, Kullander and Thorell[11] and Eckestein, Whitby, Fotherby, Butler, Mukherjee, Burnett Richards and Whitehead[12] did not find any significant change in the values of serum protein fractions.

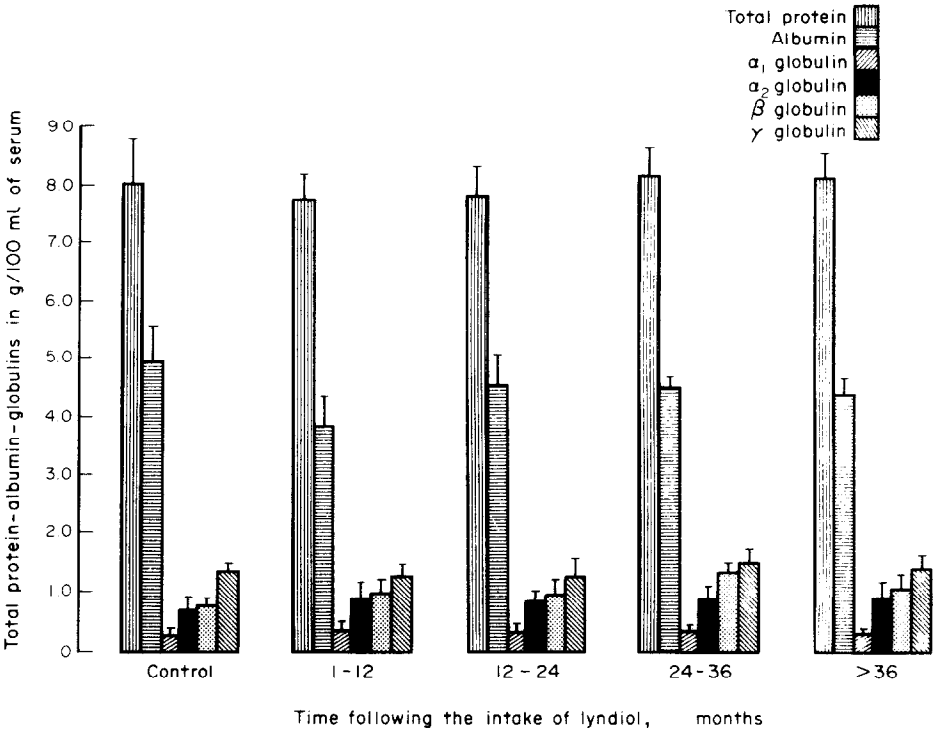


Fig. 1. Mean values of total protein, albumin, and globulin fractions in g/100 ml of serum in subjects who have used lyndiol for a period of 1–72 months, compared with control. Total number of subjects in each group from left to right are, 32, 26, 22, 14, and 13. Similar changes were observed following the use of eugynon.

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