

TOTAL ANTIOXIDANT CAPACITY, FREE PROTEIN THIOLS AND ARYLESTERASE ACTIVITY IN SUBFERTILE WOMEN

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Subfertility is defined as the inability to conceive following twelve or more months of unprotected intercourse. Antioxidants are helpful in fighting oxidant stress that negatively affect reproductive functions. The objective of this study was to assess the relationships between mid-luteal progesterone concentration and total antioxidant capacity (TAC), free protein thiols (FPT) and arylesterase activity in subfertile women, in order to identify an underlying cause for the subfertility

The subjects included in the study were healthy subfertile women (124 subjects) referred to the Nuclear Medicine Unit for hormone assay. The techniques used for progesterone, total antioxidant capacity (TAC), free protein thiols and arylesterase activity measurements were enzyme immunoassay, ferric reducing antioxidant power assay, Ellman's reagent and monitoring the rate of phenol formation from phenyl acetate, respectively. TAC and Arylesterase activity are measures of oxidant stress. Ethical clearance for the study was obtained from the Ethics committee, Postgraduate Institute of Science, University of Peradeniya. Mid-luteal progesterone concentration was used as a marker of ovulation and a level >10 ng/mL was considered as an appropriate indication of ovulation. Based on serum progesterone concentration, the subjects were classified into three groups; Anovulatory (<2 ng/mL; n=13), Weak ovulatory (2-9.99 ng/mL; n = 44) and Strong ovulatory (>10.0 ng/mL; n = 28).

Significant correlations were not observed between the mid-luteal progesterone and TAC ($p>0.05$), FPT ($p>0.05$) or arylesterase activity ($p>0.05$). The anovulatory, weak ovulatory and strong ovulatory groups had mean serum TAC of $787.5 \pm 167.8 \mu\text{mol/L}$, $721.6 \pm 173.2 \mu\text{mol/L}$ and $723.7 \pm 143.9 \mu\text{mol/L}$, respectively, which were not significantly different. The mean FPT concentrations of anovulatory, weak ovulatory and strong ovulatory subjects were $472.79 \pm 91.5 \mu\text{mol/L}$, $451.5 \pm 66.9 \mu\text{mol/L}$ and $502.4 \pm 134.4 \mu\text{mol/L}$, respectively, with no significant difference. The mean arylesterase activities of the anovulatory, weak ovulatory and strong ovulatory subjects were $148.1 \pm 30.7 \text{ kU/L}$, $139.2 \pm 36.9 \text{ kU/L}$ and $139.9 \pm 41.5 \text{ kU/L}$, respectively, with no significant difference.

Due to the absence of a study revealing mid-luteal phase serum TAC levels and arylesterase activities in healthy Sri Lankan women, comparative comments cannot be made about TAC levels or arylesterase activities in this study group. FPT concentrations were similar to values reported in other studies. The TAC, FPT concentration and arylesterase activities do not show significant differences, which is an indication that the antioxidant status was similar irrespective of the ovulatory status.