A COMPARISON OF ENHANCED CHEMILUMINESCENCE AND COLORIMETRIC ASSAYS FOR MEASUREMENT OF THE TOTAL ANTIOXIDANT CAPACITY (TAC) OF SEMINAL PLASMA

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The enhanced chemiluminescence assay is a common method to measure the non-enzymatic total antioxidant capacity (TAC) of the seminal plasma. This method is expensive and time consuming. Moreover, the probe luminol cannot be exposed to light and the signal from the signaling reagent dies off in a few minutes. A colorimetric method that has been described previously for biological fluids depends upon the suppression of a color producing reaction by antioxidants. The colorimetric test is based on the reaction between 2,2'-azino-di-[3-ethylbenzthiazoline sulphonate] (ABTS)-metmyoglobin with H$_2$O$_2$ to produce a relatively stable blue-green color read at 600 nm. Our study aims at introducing the use of this colorimetric method (Randox Total Antioxidant Status kit) to measure the TAC of seminal plasma and comparing it with the chemiluminescence method. Semen samples were obtained from 15 unselected men attending the andrology laboratory for evaluation of infertility. Seminal plasma was separated by centrifugation and divided into 2 aliquots. Levels of TAC were estimated by the chemiluminescence assay in 1 aliquot, using luminol as a probe. The second aliquot was used for the colorimetric assay. The extent of suppression of this color formation by the antioxidants in the seminal plasma was compared with the standard, Trolox. The results were reported as Trolox equivalents. The colorimetric assay is fairly predictive of the chemiluminescence assay (p < 0.001). The equation representative of this relationship is $Y_{chemiluminescence} = 28.48 + 0.36X_{colorimetric}$. With this we can explain about 75% of the variability in chemiluminescence. The colorimetric assay is a simple and accurate means of estimating the levels of TAC in seminal plasma. It circumvents the expense of a luminometer and saves the time involved in the enhanced chemiluminescence assay.