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Editorial Open Access

An Experimental Biospectroscopic Study on Seminal Plasma in Determination of Semen Quality for Evaluation of Male Infertility

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Editorial

To investigate the correlations among seminal plasma Magnesium (Mg), Phosphorus (P), Potassium (K), Calcium (Ca), Chromium (Cr), Manganese (Mn), Iron (Fe), Copper (Cu), Zinc (Zn), Selenium (Se), Molybdenum (Mo) and Iodine (I) concentrations and semen parameters [1– 15]. 500 fertile and 1000 infertile males provided a standardized semen specimen. Total Magnesium (Mg), Phosphorus (P), Potassium (K), Calcium (Ca), Chromium (Cr), Manganese (Mn), Iron (Fe), Copper (Cu), Zinc (Zn), Selenium (Se), Molybdenum (Mo) and Iodine (I) concentrations were determined by Flame Atomic Absorption Spectroscopy (FAAS), Attenuated Total Reflection Fourier Transform Infrared Spectroscopy (ATR–FTIR), Energy–Dispersive X–Ray Spectroscopy (EDX), UV–Vis spectroscopy and FT–Raman spectroscopy. Semen analysis was performed according to the Sigma-Aldrich Corporation guidelines. The strong and positive correlation was found among seminal plasma Magnesium (Mg), Phosphorus (P), Potassium (K), Calcium (Ca), Chromium (Cr), Manganese (Mn), Iron (Fe), Copper (Cu), Zinc (Zn), Selenium (Se), Molybdenum (Mo) and Iodine (I) concentrations ($p<0.001$). Also, positive correlation was found among Magnesium (Mg), Phosphorus (P), Potassium (K), Calcium (Ca), Chromium (Cr), Manganese (Mn), Iron (Fe), Copper (Cu), Zinc (Zn), Selenium (Se), Molybdenum (Mo) and Iodine (I) concentrations and vitality and motility ($p<0.0001$). On the other hand, there is negative correlation among Magnesium (Mg), Phosphorus (P), Potassium (K), Calcium (Ca), Chromium (Cr), Manganese (Mn), Iron (Fe), Copper (Cu), Zinc (Zn), Selenium (Se), Molybdenum (Mo) and Iodine (I) concentrations and abnormal morphology (Figures 1–3). Therefore, the present data indicated that Magnesium (Mg), Phosphorus (P), Potassium (K), Calcium (Ca), Chromium (Cr), Manganese (Mn), Iron (Fe), Copper (Cu), Zinc (Zn), Selenium (Se), Molybdenum (Mo) and Iodine (I) concentrations could be useful factor in determination of semen quality.

Furthermore, Molybdenum (Mo) is essential trace nutrient for humans and animals. Molybdenum (Mo) is required for normal testicular development and spermatogenesis [15–29]. In the present editorial, correlations among seminal plasma glutathione reductase, superoxide dismutase and catalase enzymes activities as Molybdenum (Mo) status and semen parameters are evaluated in 4800 males. Semen analysis was performed according to the Sigma-Aldrich Corporation guidelines. The 4800 males were subdivided into five main groups as normospermia, oligozoospermia, asthenozoospermia, azoospermia and varicocele according to their spermiograms. Seminal plasma glutathione reductase, superoxide dismutase and catalase enzymes activities were determined by Kit (Sigma-Aldrich Corporation). The results showed that glutathione reductase, superoxide dismutase and catalase enzymes activities are lower than oligozoospermia, asthenozoospermia, azoospermia and varicocele groups.

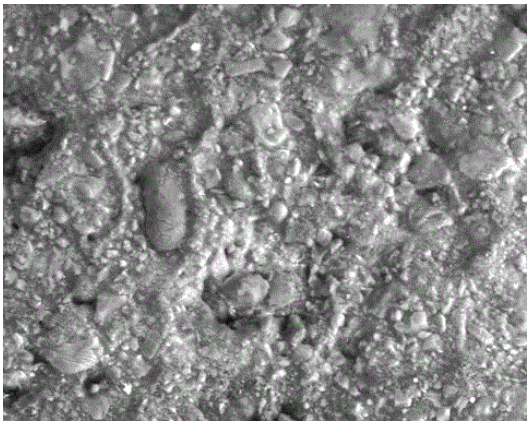

Figure 1: Energy–Dispersive X–Ray Spectroscopy (EDX) image of seminal plasma with 285000x zoom.

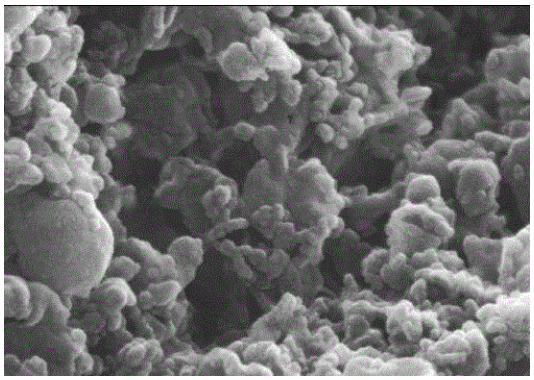

Figure 2: Scanning Electron Microscope (SEM) image of seminal plasma with 240000x zoom.

Also, there are significant and positive correlations among glutathione reductase, superoxide dismutase and catalase enzymes activities and seminal plasma fructose, glucose and galactose concentrations, white blood cells, tail defects of sperms, coiled tail sperms and short tail sperms. On the other hand, the present data showed that significant and negative correlations among vitality, sperm count, motility and normal morphology.

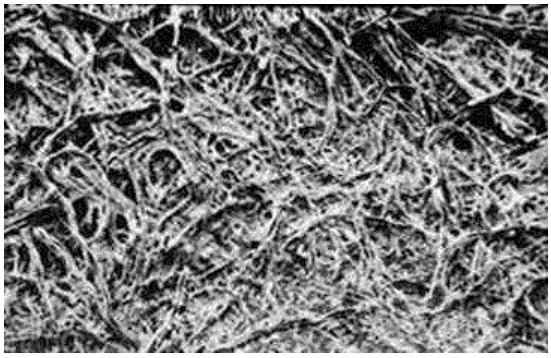

Figure 3: Transmission Electron Microscope (TEM) image of seminal plasma with 240000x zoom.

Therefore, the present editorial showed that measurements of glutathione reductase, superoxide dismutase and catalase enzymes activities as Molybdenum (Mo) status could be a good marker for evaluation of male infertility.

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