STUDY ON THE EFFECT OF SELENIUM METAL ON THE CHEMICAL STATUS OF GSH IN AQUEOUS MEDIUM

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ABSTRACT

Selenium not only scavenges reactive oxygen species before these free radicals can damage cells, but also regulates nuclear factor activities within the cells. selenium has shown great promise in autoimmune inflammatory response. Many other autoimmune conditions are associated with low selenium levels, including autoimmune hepatitis and diabetes.. Thus it is interesting to study the effect of selenium on the glutathione (GSH). The effect of selenium on the chemical status of the GSH in aqueous solution has been studied using U.V. Spectrophotometer by using Ellman's method. 5, 5-Dithiobis, 2-Nitrobenzoic Acid (DTNB), GSH, selenium dioxide, phosphate Buffer pH 7.6, hydrochloric acid and other laboratory instruments have been used to perform research work. The effect of selenium on the chemical status of GSH was checked in aqueous with different concentrations of selenium salt and also with the passage of time. There was found a profound effect on decreasing the concentration of GSH in aqueous medium, as the concentration is increased and time has passed. Study helps to understand the effect of this metal on the chemical status of GSH and the depletion of reduced GSH and this depletion increased with the increase in selenium salt concentration and with the passage of time.

INTRODUCTION

GSH (glutamylcysteinylglycine) is a sulfhydryl (-SH) antioxidant, antitoxin, and enzyme cofactor. GSH is ubiquitous in animals, plants, and microorganisms, and being water soluble is found mainly in the cell cytosol and other aqueous phases of the living system (Kosower and Kosower 1978; Kidd, 1991; Lomaestro and Malone, 1995; Meister, 1976).

GSH exists in two forms: The antioxidant "reduced glutathione" tripeptide is conventionally called GSH and abbreviated GSH; the oxidized form is a sulfur-sulfur linked compound, known as GSH disulfide or GSSG. The GSSG/GSH ratio may be a sensitive indicator of oxidative stress.

GSH has potent electron-donating capacity, as indicated by the high negative redox potential of the GSH/GSSH "redox couple" (E'_0 = - 0.33v) (Lewin, 1976) .Its redox potential renders GSH both a potent antioxidant and a convenient cofactor for enzymatic reactions that require readily available electron pairs (Kehrer and Lund, 1994). The reducing power of GSH is a measure of its free radical scavenging, electron-donating, and sulfhydryl-donating capacity.

The reduced GSH molecule consists of three amino acids - Glutamic acid, Cysteine, and Glycine - covalently joined end-to-end. The sulfhydryl (-SH) group, which gives the molecule its electron-donating character, comes from the cysteine residue.

GSH is present inside cells mainly in its reduced (electron-rich, antioxidant) GSH form. In the healthy cell GSSG, the oxidized (electron-poor) form, rarely exceeds 10 percent of total cell GSH (Kosower and Kosower 1978). Intracellular GSH status appears to be a sensitive indicator of the cell's overall health, and of its ability to resist toxic challenge. Experimental GSH depletion can trigger suicide of the cell by a process known as apoptosis (Duke *et al*., 1996; Nobel *et al*., 1995).

selenium is available in a number of different forms for supplementation, and each has slightly different uses and benefits. Ideally, a good supplement should contain all four of the following forms of selenium for broad-spectrum protection.

1- In the form of the salt, sodium selenite, selenium has been used to reduce post-operative swelling that is related to the increased free radical stresses produced by surgery. Related beneficial effects are seen when sodium selenite