Doctoral Dissertation Abstracts

THE EFFECTS OF ANTIOXIDATIVE VITAMIN AND TRANSITION METALS IN THE EXPERIMENTAL DIABETIC RATS

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It has been stated that the oxygen free radicals cause macro and micro vascular complications in diabetics. On the other hand, it is claimed that cobalt has a blood glucose lowering effect. Furthermore, it was postulated that tissue levels of ascorbic acid have changed in diabetics. From this point of view, STZ induced diabetic rats were given cobalt chloride and L-ascorbic acid with cobalt chloride.

For this purpose, experimental rats were divided into six groups as control (C), diabetics (D), cobalt chloride applied (Co) (0,5 mM), cobalt chloride applied diabetics (D+Co), cobalt chloride and L-ascorbic acid (1g/L) applied (Co+AA) and cobalt chloride and L-ascorbic acid applied diabetics (D+Co+AA). Blood glucose levels of the rats were measured at the end of 2^{nd}, 4^{th} and 6^{th} weeks. Tissue samples of liver and kidney were taken from each group at 2^{nd}, 4^{th} and 6^{th} weeks and the activities of catalase, glutathione peroxidase, superoxide dismutase and levels of nitrite, TBARS and ascorbic acid were analysed.

In our study, it has been found that the blood glucose, which increases in diabetics, is reduced by providing cobalt. There was a decrease in the catalase, glutathione peroxidase and superoxide dismutase activities of the tissues with induced cobalt. However, cobalt also reduces nitrite and TBARS, which are increased in diabetics. It has been found out that, the usage of ascorbic acid together with cobalt, do not modify the results, except ascorbic acid levels of tissues.

As a result, we believe that at the early stages of diabetes, cobalt dose, which was used in this study, can be considered as appropriate as regards to regulating oxidative and antioxidative systems, in addition to its hyperglycemia lowering effect.

Key words: Diabetes mellitus, cobalt, ascorbic acid, antioxidative enzymes, lipid peroxide.

STUDIES ON PLATINIUM(II) COMPLEXES OF SOME 1,2-DISUBSTITUTED BENZIMIDAZOLE DERIVATIVES

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In this study, six 2-non /-methyl /-ethyl / - aminomethyl /-benzyl/-phenoxymethyl substituted benzimidazoles and three 1-methyl-2-methyl/-hydroxymethyl/-phenyl substituted benzimidazoles were synthesized in order to investigate for their in vitro antitumor activities and the role of the free N-H group of the benzimidazole ring of the ligands and their Pt(II) complexes on the activity .

2-substituted ligands were obtained by condensing 1,2-phenylendiamine with an appropriate carboxylic acid in the presence of 4-5 N hydrochoric acid or polyphosphoric acid, 1,2-dimethyl and 1-methyl-2-phenylbenzimidazoles were obtained by the alkylation reactions of 2-methyl and 2-phenylbenzimidazoles with NaH and methyl iodide in the medium of DMF. N1-methylation of 2-hydroxymethylbenzimidazole was made by using sodium hydroxide and dimethylsulphate.

The complexes were synthesized by the reaction of the ligands and K_2PtCl_4 in the medium of ethanol-H_2O or DMF.

The ligands synthesized were reported in the literature before. The complexes are original except Compound 10,11,13.

The chemical structure of the Pt(II) complexes were characterized by their elemental analyses data and their IR and 1H NMR spectra compairing with those of the ligands.

It was determined that the general formula of the complexes of the Pt(II) complexes were $[PtL_2Cl_2]$ [Where L= 2-hydrogen/ -methyl/ -ethyl/ -benzyl/ -phenoxymethyl and 1-methyl-2-methyl/ -phenylbenzimidazole] and $[PtLCl_2]$ [Where L = 2-aminomethylbenzimidazole, 1-methyl-2-hydroxymethylbenzimidazole].

It was concluded that the benzimidazole derivatives behave as monodentate ligands being bound to the platinum atoms via their tertiary nitrogen atoms and the benzimidazole derivatives behave as bidentate ligands being bound to the platinum atoms via the tertiary nitrogen and also the hetero atom of the side chain of the benzimidazole ring.

All the Pt(II) complexes and their ligands were tested for their preliminary in vitro antitumor activity with İRec-Assayî test. Based on the data obtained in this study some of the Pt (II) complexes of the benzimidazole derivatives tested might be taken into consideration as promising antitumor compounds. And also it seems that, it is possible to interpret free N-H group was necessary for the activity of the Pt(II) complexes tested. But, in order to confirm these preliminary results further chemical and biological activity studies are required.