

PROTECTIVE ROLE OF β CYCLODEXTRIN AGAINST PROTEIN DEGRADATION INDUCED BY ANTIBIOTICS

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ABSTRACT

Cyclodextrin has a wide range of applications in different areas of drug delivery and pharmaceutical industry due to its complexation ability and other versatile characteristics. The most common pharmaceutical application of cyclodextrin is to enhance the solubility, stability, safety and bioavailability of drug molecules. The purpose of the present study was to investigate the protective activity of β cyclodextrin against the degradation of bovine serum albumin (BSA) induced by some antibiotics as amoxycilin, cloxacillin-Na and sulphamethoxazole as indicated by the estimation of some markers of protein oxidation. BSA was incubated with different concentrations of the antibiotics under investigation. An aliquot from this mixture was used for sodium dodecyl sulphate/polyacrylamide gel electrophoresis (SDS-PAGE). Oxidative damage of protein was assessed as a generation of carbonyl, quenone and advanced oxidation protein products (AOPP). All the antibiotics of this study had a degradation effect on BSA but sulphamethoxazole showed the highest oxidant activity. The increase in protein oxidation products was concentration dependent. Moreover, this effect of antibiotics was ameliorated by β cyclodextrin. The carbonyl, quenone and AOPP contents were highly significantly elevated in sulphamethoxazole, amoxycilin and cloxacillin-Na -treated protein respectively when compared to the control and β cyclodextrin protein samples. The present results confirm the oxidant activities of the above antibiotics which may be attributed to the generation of unstable radicals.

KEY WORDS:Cyclodextrins,Proteins Degradations, Antibiotics, SDS-PAGE, Protein Oxidation Products