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ZOOLOGY

BIOCHEMICAL ALTERATIONS IN DNA CONTENT OF GILL AND GONAD TISSUES OF *CORBICULA STRIATELLA* DUE TO 5-FLUOROURACIL TOXICITY

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Abstract

Present paper deals with study of impact of 5flurouracil on DNA content of gill and gonad of *Corbicula striatella*. It was found that DNA content of gill and gonad of *Corbicula striatella* was decreased due to 5flurouracil after 15 and 30 days.

Keywords: DNA content, *Corbicula striatella*, 5- Fluorouracil

Introduction

Biochemical modulation is a special type of combination chemotherapy which aims to selectively improve the therapeutic index by increasing the antitumour effect and protecting against toxic side effects. In the past decade a number of biochemical modulation approaches have been tested to improve the activity of 5-fluorouracil. 5FU itself has only modest anticancer activity but has been shown to be a very attractive target for biochemical modulation. The main conclusion is that properly applied biochemical modulation schedules may lead to successful use in the clinic (Peter, 1991). Excess of one of the deoxyribonucleotide precursors increases the frequency of miscorporation of that deoxyribonucleotide and inhibits the proofreading mechanisms. Increase in the sensitivity to alkylating DNA damaging agents has been observed when the deoxyribonucleotide pools are unbalanced (Phear et al., 1987). It has been observed that heavy metals can cause biochemical alterations such as inhibition of enzymes, metabolic disorder, genetic damage, hypertension and cancer (Underwood, 1971; Lucky and Venugopal, 1977). The nephrotoxicity, ototoxicity and neurotoxicity of 5-fluorouracil may be due to reactions with cellular molecules other than DNA. The rate of replicative DNA synthesis was unexpectedly increased and the deoxyribonucleotide pools unbalanced (Skog et al., 1994)

Materials and Methods

Attempts will be made in this study to select Fresh water bivalves, *Corbicula striatella* were collected from of Girna dam which is about at the distance of 50 K.M. away from Chalisgaon City of Maharashtra State. First they were made acclimatized to laboratory condition and were washed. The water in the aquarium was changed regularly after every 24 hours. After the acclimatization, bivalves, *Corbicula striatella* were divided into two groups with equal numbers of animals. They were kept in separate aquarium for 15 and 30 days out of remaining one groups treated by chronic concentration $LC_{50/10}$ value of 96 hrs) of 5flurouracil (0.836 ppm) On 15th and 30th day of exposure, bivalves from each experimental group were sacrificed and gills, and gonads, were removed. These tissues were dried in oven at 75 ^{0}C to 80 ^{0}C till constant weight was obtained and blended into dry powder. These powders were used for the estimation of biochemical components of DNA to observe efficacy of 5-fluorouracil.

Results and Discussion

It is clear from table 1 that, total DNA content in tissues of gill and gonad of *Corbicula striatella* was decreased when it was exposed to chronic dose of 5-flurouracil for 15 and 30 days.

5-fluorouracil remains the mainstay of treatment for advanced gastric cancer (AGC) and no standard chemotherapy regimen exists. Combinations of irinotecan with folinic acid and infusional 5-fluorouracil (5-FU) (ILF) have shown good efficacy with acceptable toxicity as hematologic toxicity (anemia, neutropenia and leucopenia), Non-hematologic (nausea/vomiting) and diarrhea in patients with metastatic colorectal cancer (Kunz, 1998). Unbalanced supply deoxyribonucleotide triphosphates affect DNA replication and give rise to a range of genetic effects such as mutations, mitotic recombination's, chromosome aberrations and DNA strand breakage (Memuth,1989).

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Table 1 Alterations in the DNA content mg/100mg dry weight+ S.E. in gill and gonad tissues of *Corbicula striatella* treatment with 5 flurouracil.

Tissues	Days	Control	Experimental	Student 't' test 'p' value	% increases (+) or decreases (-)
Gill	15	5.38 ± 0.358	4.61± 0.421 ^{NS}	P < 0.01	14.31%
	30	4.61± 0.451	3.84 ± 0.249^{NS}	P < 0.01	16.70 %
			3.58 ± 0.548 ^{NS}		
Gonad	15	4.87±0.246	4.35±0.126***	P < 0.01	10.67%
	30	4.54±0.369	2.82± 0.214*	P < 0.001	26.356 %
			3.33±0.346 **		

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