Apoptotic cell death in erythrocytes of p53-deficient medaka (Oryzias latipes)after c-irradiation

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Abstract:

Purpose: Previous studies have examined the effects of c-irradiation (c-IR) on wild-type and p53 mutant Medaka (Oryzias latipes) 24 hours after irradiation and in the present work, apoptosis and alterations in erythrocytes of 4, 8 and 24 h and 14 days after gamma-ray irradiation were reported as genotoxic biomarkers of c-irradiation. Materials and methods: Sexually mature wild-type, WT (Hd-rR) and p53(□/□) adult female medaka (O. latipes) were exposed to 4 Gy dose of c-IR and sampling were collected after 4, 8 and 24 h and 14 days. Results: Apoptosis and morphological alterations were observed from 4 h after irradiation and remarkably increased 8 h after irradiation in the wild-type. Apoptotic cell death has been observed 8 h after irradiation most prominently but subtle in p53 mutant medaka. All these phenotypes were recovered 14 days after irradiation in both strains. Although no micronuclei were seen in any group, nuclear abnormalities were observed in red blood cells. Both apoptosis and morphological alterations in erythrocytes were decreased after 24 and 14 days after c-irradiation. Conclusions: We conclude that apoptosis and malformations caused by 4 Gy c-irradiation in the erythrocytes of medaka fish occurs from 4□24 h and the initial response until 8 h was p53-dependent.

Keywords:

Apoptosis; erythrocytes; 4 Gy; medaka; p53

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