

Evaluation of alterations in signaling associated with lipid metabolism causing Adriamycin-induced cardiotoxicity

Heart is a postmitotic organ and functions continuously for the life of mammals (Le & Chong, 2016). It is a most energy requiring organ of the body. Heart functions from the ATP generated by lipid metabolism since it requires more energy to meet the metabolic demands of the body. 60%-80% of heart energy are utilized from the lipid metabolism/oxidation of fatty acids. Cardiovascular disease is one of the leading causes of death worldwide. Heart diseases are caused either by hereditary or habitual actions and also due to the other complications. Cardiotoxicity is a condition of damage of heart muscles due to the chemotherapy drugs and medications taken for control of other diseases. Assessing cardiotoxicity potential of a drug is important for the health of the individuals. Drug induced cardiotoxicity is a short- or long-term complication of anticancer therapy that causes cardiomyopathy which may eventually leads to heart failure. (Ferri et al., 2013; Kelleni & Abdelbasset, 2018) Cancer rates higher percentage of death next to cardiovascular disease in the developed and developing nations. Normally, one in three people are affected by cancer and one patient in every 10 treated with chemotherapy are reported for cardiotoxicity. Cardiotoxicity is not only limited to anticancer drugs but also to antineoplastic agents and antiretroviral drugs. Adriamycin is an anticancer drug is widely used for various types of cancer, inhibits the tumor progression by controlling the expression of genes. Anthracyclines, cyclophosphamide, zidovudine are some of the examples of drugs that cause cardiotoxicity. These drugs directly or indirectly modulate cardiac mitochondrial function and leads to cardiomyocyte and endothelial cell death. (Ji & Mitchell, 1994) Heart failures occurs due to the lack of oxygen that are eventually obtained from the lipid metabolism which are the major source of energy for heart. (Goldberg et al., 2012) Mechanism of lipid metabolism will subsequently involve in the

cardiac mitochondrial function there by causing toxicity to the heart. Identifying the mechanism/pathway in which the drug induced toxicity occurs will help to report the properties of the drug that are essential for public health concern.

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