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ISSN: 2153-2435
Pharmaceutica Analytica Acta

Commentary

Potential Medications of Cardiac Problems and Uses of Doxorubicin Drug

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DESCRIPTION

Doxorubicin is a crucial chemotherapeutic medicine and an anthracycline anti-tumor agent however patients are unable to continue receiving it because of its side effects, which include cardio toxicity. Analyzed the efficacy and mechanisms of licensed medications with potential preventive effects against doxorubicin-induced cardiac events using databases. Doxorubicin is an anthracycline anti-tumor medication that works by inserting itself into the DNA base pairs of tumor cells and inhibiting the reactions of DNA polymerase, RNA polymerase, and topoisomerase II, thereby stifling DNA and RNA creation. Doxorubicin is regarded as a crucial chemotherapeutic drug because of the effectiveness it has been shown to have in treating a variety of malignancies, including lung, gastrointestinal, breast, bladder, malignant lymphoma, and osteosarcoma. Doxorubicin has a potent anti-tumor impact, but it can also cause cardio toxicity, which makes it difficult for patients to continue receiving treatment.

Acute and long-term illnesses can result from doxorubicin cardio toxicity. Chronic myocardial damage can result in heart failure, with a 3-year survival rate of only around 50% in the absence of treatment. It is known to occur cumulatively and dose-dependently. In actual clinical practice, dose limitation is used to treat doxorubicin-induced persistent myocardial damage. However, acute myocardial injury is reported to happen within a few days of taking doxorubicin and does not appear to be correlated with dosage.

Administration, producing momentary ventricular hypo function as well as other signs and symptoms. There is currently no known prevention for doxorubicin-induced acute myocardial damage. Doxorubicin-induced cardiac injury most likely has an underlying mechanism involving oxidative stress brought on by free radical generation, feretories, apoptosis brought on by mitochondrial damage in cardiomyocytes, and DNA damage brought on by topoisomerase II inhibition.

Various investigations have found conflicting results regarding dexrazoxane impact on doxorubicin-induced cardio toxicity and doxorubicin-specific anti-tumor actions. Clinical trials carried out in the United States found that children and teenagers who were given dexrazoxane to prevent cardiomyopathy brought on by long-term anthracycline administration also had an elevated risk of acute myeloid leukemia and myelodysplastic syndrome. The use of dexrazoxane to prevent cardiomyopathy in patients under the age of 18 was not necessary the usage of dexrazoxane was advised to be avoided.

However, a novel method to drug development called medication repositioning was developed, in which already-approved pharmaceuticals are examined for alternative pharmacological effects to maximize their potential to treat additional disorders. Drugs can now be successfully repurposed thanks to the development of extensive medical information databases that provide details on changed gene expression and negative effects. It has been used to research the development of novel therapeutic medicines.

These databases have been used in several studies, including those carried out by our research team, to find medications that can stop the side effects linked to high-risk medications. Databases to investigate currently available, licensed medications with possible safeguards against doxorubicin-induced cardiac events and investigate their efficacies and related mechanisms. Cardio toxicity and other adverse effects specific to doxorubicin pose serious clinical problems since they prevent the continuation of therapy. Discovered using that the drug doxorubicin changes the expression of genes related to inflammatory reactions and apoptosis, which are crucial to the mechanism of cardio toxicity.

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Received: 03-Oct-2022, Manuscript no: PAA-22-18649, **Editorial assigned:** 07-Oct-2022, PreQC no: PAA-22-18649 (PQ), **Reviewed:** 20-Oct-2022, QC no: PAA-22-18652, **Revised:** 27-Oct-2022, Manuscript no: PAA-22-18649 (R), **Published:** 04-Nov-2022, DOI: 10.35248/2153-2435.22.13.697

Citation: Yossef A (2022) Potential Medications of Cardiac Problems and Uses of Doxorubicin Drug. Pharm Anal Acta. 13:697