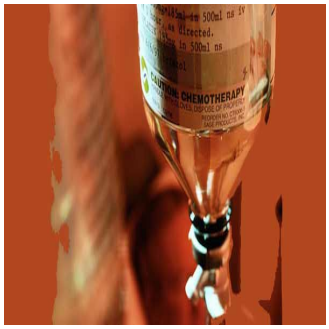
HealthManagement
Promoting Management and Leadership

#euroecho: Cancer Drugs Encapsulation Reduces Heart Damage



Echocardiography detects early deterioration of heart function allowing prevention medication to be given

Austrian researchers have shown that a new technique which wraps chemotherapy drugs in a fatty cover (called a liposome) reduces heart damage, in a study presented today at EuroEcho-Imaging 2014 by Professor Jutta Bergler-Klein and Professor Mariann Gyöngyösi from the Medical University of Vienna, Austria.

EuroEcho-Imaging is the annual meeting of the European Association of Cardiovascular Imaging (EACVI), a branch of the European Society of Cardiology (ESC), and is held 3-6 December in Vienna.

Professor Bergler-Klein said: “Cancer survival has greatly improved, especially in breast cancer and lymphomas. But many chemotherapies, in particular anthracyclines, cause cardiac side effects that can lead to cardiomyopathy and severe heart failure. This is a frequent problem and when we see these patients it’s terrible, for example a breast cancer patient who is developing heart failure. Of course we cannot ask oncologists to stop the chemotherapy because without it the patient will die.”

She added: “Cardiotoxicity can occur acutely or up to 30 years after chemotherapy and is the second most common cause of death in cancer patients, after secondary malignancy in childhood cancer survivors. Risk increases with more chemotherapy or when radiation is also given. That is why it’s so important to use a regimen that has as few cardiac side effects as possible.”

Professor Bergler-Klein continued: “Liposomal encapsulation is a new technique which wraps the chemotherapy drug in a fatty cover called a liposome. More of the drug reaches the cancer cells because there is less degradation and there are fewer side effects on healthy cells because the fat cover acts as a barrier. The drug stays in the bloodstream longer, allowing higher cumulative doses to be given. We tested whether non-pegylated liposome encapsulation of the anthracycline doxorubicin (called Myocet) could decrease its cardiotoxicity compared to conventional doxorubicin or epirubicin, another anthracycline.”

The study included 24 pigs that were randomised to receive the human dose-equivalent of either Myocet, conventional doxorubicin, or epirubicin in 3 cycles. Cardiac function was assessed by echocardiography and magnetic resonance imaging (MRI) at baseline and follow up (after about 3 months). Laboratory follow up included haematology, renal function, and measurement of the cardiac enzymes troponin and BNP. The epirubicin group was excluded from the final analyses because of low survival levels.

Professor Bergler-Klein said: “The dose, imaging methodology and blood parameters simulate the monitoring that patients on this treatment would receive and produces valuable translational data.”

The researchers found that the group receiving Myocet had better diastolic and systolic function in the left and right ventricles, compared to conventional doxorubicin. The Myocet group also had less fibrosis development in the myocardium as shown by MRI and histology staining.

Professor Bergler-Klein said: “Our study shows that doxorubicin encapsulated in a liposome had fewer cardiac side effects than doxorubicin given in the conventional way. We did find cardiac toxicity in the Myocet group as well, despite the fact that the pigs were young, healthy, and received anthracyclines for only a short period. This emphasises how important it is for all cancer patients taking anthracyclines to receive cardiac monitoring using echocardiography and biomarkers, and MRI where indicated.”

She added: “Many patients who recover after chemotherapy have asymptomatic heart damage which can become symptomatic as they get older. When heart problems are picked up early patients can be given preventive treatment including ACE inhibitors, angiotensin receptor blockers or beta blockers to prevent the progression to overt heart failure.”

The researchers are conducting gene expression profiling on the histology samples which may explain the better outcome and cardiac function after Myocet therapy. They have found differences in the expression of the genes that control energy use and the metabolic state, with better regulation in the Myocet group.

Professor Bergler-Klein concluded: “Anthracyclines are a cornerstone of oncology treatment but the more cycles needed to fight cancer, the more cardiotoxic side effects the patient will have. We have shown that the cardiotoxicity can be reduced with liposomal encapsulation. Cardiac monitoring of all patients receiving anthracyclines is essential to detect early deterioration of the heart and give preventive treatment.”

Source: ESC

Published on : Fri, 5 Dec 2014