Ameliorative potential of Eugenol and Carvacrol in cobalt mediated hypercontraction in isolated Wistar rat aorta

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Cobalt is a very important element that is naturally present in biochemically important compounds like cyanocobalamin (Vit B_{12}). But occupational exposure of cobalt is reported to cause various diseases like lung cancer, cardiovascular diseases like cardiomyopathy and gastrointestinal diseases. Cobalt is reported to augment vascular contractility in spontaneously hypertensive rats. So, we have planned this study to check contractile effect of cobalt in toxic range on Wistar rat aortic rings, and to study the ameliorative potential of eugenol and carvacrol which are plant derived terpenoids and possess antioxidant activities using organ bath system (Ad instruments). In our study, a hyper-contractile response was seen at all the various concentrations of cobalt used, i.e. 800 nM, 10 µM, and 50 µM and the hypercontractile response in case of cobalt incubated aortic rings were 132%, 128%, 108% respectively with respect to control taken as 100% with Phenylephrine induced contraction. Eugenol and carvacrol could act as possible ameliorators of hypercontraction. We have noticed that at saturating concentration of 100 µM eugenol and 10 µM carvacrol caused 38% and 42% relaxation in cobalt unexposed aortic rings; while 40% and 48% relaxation was observed when cobalt exposed aortic rings were co-incubated with eugenol and carvacrol. In our study, we have found that the relaxation caused by both the natural compounds is due to the quenching of ROS and by enhancing nitric oxide release from endothelium of aorta. To conclude, acute exposure of cobalt to aortic rings causes increase in hypercontractile response by generating oxidative stress, which is effectively lessened by eugenol and carvacrol.

Speaker Biography

Shahnawaz Ahmad Wani did his MSc Biochemistry from Jamia Millia Islamia (JMI), New Delhi India. He is pursuing PhD from Department of Bioscience, JMI and is working on topic titled as "Effect of Metal Pollutants on Cardiovascular System". He has presented four conference paper in various national and international seminars. He has one publication on titled mechanism of flavonoids in smooth muscle relaxation.

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