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Endothelial dysfunction in early stages of chronic kidney disease: a pilot study

Chronic kidney disease (CKD) is characterized by the high prevalence of atherosclerosis. Endothelial dysfunction represents an obligatory, prodromal phase in the atherosclerosis process. Nitric oxide (NO) is one of the most intensively studied mediator of endothelial function and is involved in vasodilatation. NO is decreased in endothelial dysfunction either due to reduced availability of substrate L-arginine or due to increased production of inhibitor asymmetric dimethyl arginine (ADMA) for NO synthase, an enzyme involved in the synthesis of NO.[1]

Plasma nitrates as a measure of NO production have been shown to correlate with flow mediated dilatation in healthy adults[2] and hence has been used as a marker of endothelial function. Though there are a large body of data on endothelial function in later stages of CKD,[3-7] few studies are available which have assessed the endothelial function in early stages of CKD.

Hence the present study was taken up to evaluate plasma nitrate levels as a noninvasive marker of endothelial function in early stages of CKD. Nine patients with CKD (stages I and II) classified as per National Kidney Foundation's Kidney Disease Outcomes Quality Initiative (KDOQI) guidelines[8] attending the Nephrology outpatient department at Sri Venkateswara Institute of Medical Sciences, Tirupati were included in the study. Written informed consent was obtained from all patients participating in the study that was approved by the Institutional Ethical Committee. Patients with acute kidney injury and acute on CKD were excluded from the study. Nine age - and sex-matched healthy individuals were studied as controls.

Plasma nitrates were estimated by cadmium-reduction method[9] and plasma ADMA levels were estimated by high performance liquid chromatography.[10] The levels of NO measured as plasma nitrates were found to be significantly decreased (56.70 ± 8.53 vs 38.20 ± 18.86 µmol/L, p= 0.034) in the CKD patients when compared to controls. No significant difference was observed in the levels of ADMA between the two groups(0.43 ± 0.41 Vs 0.21 ± 0.06 µmol/L, p = 0.121), compared to controls. Our observations suggest the presence of endothelial dysfunction as evidenced by decrease in NO production even in early stages of CKD patients. Further study of the factors leading to endothelial dysfunction in the early stages of CKD is warranted.

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Evaluation of immunochromatographic and ELISA methods in detection of anti-HCV antibodies among healthy blood donors: a pilot study

Blood transfusion services are a vital part of modern health care system. With every unit of blood there is 1% chance of transfusion associated problems including transfusion transmitted infectious disease acquisition.[1] Transfusing infected blood to patients in need amounts to a criminal offence. It is mandatory to test every unit of donor blood for antibodies to human immunodeficiency virus (HIV-1 and HIV- 2), syphilis, hepatitis C, hepatitis B and for malarial parasite.[2] Hepatitis C virus (HCV) is an emerging infection in India and an important pathogen causing liver disease. The prevalence of HCV infection in voluntary or mixed donors has been observed to be below 2%.[3] The high risk of chronicity of this blood-borne infection and its association with hepatocellular carcinoma underscores its public health importance. Blood transfusion and unsafe therapeutic interventions by infected needles are two preventable modalities of spread of HCV infection.

In modern blood banks, enzyme linked immunosorbent assay (ELISA) method is the recommended and preferred screening method for detecting anti-HCV immunoglobulin G (IgG) antibodies. However, many blood banks in India do not have the facilities to carry out the ELISA test for anti-HCV IgG antibodies and prefer to use "easy to perform", "user friendly" immunochromatographic rapid screening tests instead.[4] A pilot study was therefore conducted in healthy blood donors to study the performance of immunochromatographic (rapid) device test in the detection of anti-HCV IgG antibodies, considering ELISA method as the '*gold standard*'.

The study was carried out on 1002 blood samples collected from apparently healthy voluntary as well as replacement donors over a period of two months. All the samples were tested for anti-HCV IgG antibodies by ELISA method (Hepano- stica HCV Ultra; Beijing United Biomedical Co.,LTD,Wales, UK) and immunochromatographic (rapid) device test kit (SD BIOLINE HCV Standard Diagnostics. Inc., Kyongi-do Korea) simultaneously as per the manufacturer's instructions. Considering ELISA test as *gold standard*,the sensitivity, specificity, positive-predictive value and negative-predictive value were calculated (Table 1).

Table 1: Performance characteristics of HCV ELISA and rapid test kits

	ELISA (reactive)	ELISA (non-reactive)	Total
Rapid (non-reactive)	7	994	1001
Rapid (reactive)	0	1	1
Total	7	995	1002

HCV=Hepatitis C Virus; ELISA=enzyme linked Immunosorbent Assay

The rapid immunochromatographic test was found to have a sensitivity, specificity, positive-predictive value and a negative predictive value of 0%, 99.9%,0% and 99.3% respectively. None of the