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### Screening for Microalbuminuria in the early detection of diabetic nephropathy: A cheap and simple method

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#### Abstract:

Prompt detection of renal involvement through evaluation of microalbuminuria can both reduce mortality in diabetic patients and significantly reduce the cost of managing these patients. To this end, Micral test strips have been used as a screening tool in this group of patients though not yet in our country. The present study aimed to evaluate this test and to obtain a simpler and less expensive method of screening for microalbuminuria. In this study, 200 type 1 and type 2 diabetic patients referred to the Endocrine & Metabolism Research Center of the Tehran university of medical Sciences were evaluated for microalbuminuria. Entry criteria consisted of a history of recognized diabetes longer than or equal to 5 years. Exclusion criteria included development of urinary tract infection, pyrexia, and a history of uncontrolled hypertension. Every patient first completed a data questionnaire and then provided a first-void urine sample, which was tested for microalbuminuria with a urinary protein test strip (an Iranian-made Uri-Yab and a German-made BM-test-GP strip) and the sulphosalicylic acid chemical method. Negative samples were tested further using Micral test strips (based on gold-lable immunochromatography) and the microalbumin measurement kit manufactured by Dako. Germany (based on turbidometry using a Hitachi autoanalyser). 126 women and 74 men were recruited into the study. The average age of the sample was 40.7 years (range=16 to 63 years); 17 patients had IDDM and 173, NIDDM. Average duration of recognized diabetes was 8.75 years. Based on results obtained using chemical analysis and foreign-made tests strips, 46 patients (23%) had macroalbuminuria, though the detection rate using Iranian-made test strips was 18 percent (36 patients). A further 16.2 percent of patients had microalbuminuria, with an average urinary albumin excretion of 28.7 mg per liter. Compared with colorimetric methods, the Micral test yielded a sensitivity of 93% and a specificity of 87 percent. Furthermore, the negative predictive value of the Micral test was 0.92, compared with a figure of 0.94 for a combination of the sulphosalicylic acid method and the BM-Test-GP strips. The results we obtained for the Micral test as a screening tool concurs with the results of numerous other studies. Diurnal variations in albumin excretion dictate the performance of screening tests on three different occasions at specified regular intervals. Given the relatively high cost of Micral strips, it seems that a simpler and less expensive method should be devised for our country. We observed a higher negative predictive value for the combined sulphosalicylic+BM-Test-GP method than for the Micral strips. The cost of the latter combination comes to 2,000 Rials (@0.25 US\$), which is easily affordable for most patients; the methodology falls comfortably within the expertise of medical diagnostic laboratories in Iran. More detailed studies, using 24-

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