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Diabetic nephropathy in Surinamese South Asian subjects

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Citation

Chandieshaw, P. K. (2008, March 6). *Diabetic nephropathy in Surinamese South Asian subjects*. Retrieved from <https://hdl.handle.net/1887/12638>

Version: Corrected Publisher's Version

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Note: To cite this publication please use the final published version (if applicable).



Benares aan de Ganges, India, ca. 1880.

Chapter

1

General introduction

Diabetic nephropathy is a progressive kidney disease caused by angiopathy of capillaries in the kidney glomeruli. It is characterized by nodular glomerulosclerosis. It is due to longstanding diabetes mellitus, and is the major cause for end-stage renal failure in many Western countries. [1] Besides these renal impacts, leading to dialysis, it is also associated with a high incidence of cardiovascular and eye complications due to concurrent angiopathy in these organs. [2] South Asian immigrants (East Indians) have a high incidence of type 2 diabetes and diabetic cardiovascular and renal complications compared to European persons. [3-11]

South Asian immigrants originally descend from the Indian Subcontinent, previously called British India. The social-scientific literature uses the term East-Indians to refer to immigrated Indians to the Caribbean. However, in the medical literature, immigrated Indians are referred by South Asians. In this thesis we will use the term South Asians because this is currently the most used term to refer to immigrated Indians in the medical literature.

The abolishment of slavery in the European colonies between 1834 and 1863 created the need for a new source of labour on the plantations. [12] In those days, Suriname was a prosperous Dutch Colony in South America. Indian natives (South Asians) were contracted by the Dutch government to work for five years in Suriname in exchange for a small wage, plus room and board. Between 1873 and 1916, about 34000 South Asians were brought to Suriname. [13] Although they had freedom of passage back to India, 22500 persons (66%) stayed in Suriname and has now grown to 300000 persons of whom 160000 live in the Netherlands. [14] Due to the independence of Suriname in 1975 and the political climate, a large group of Surinamese immigrants settled in the Netherlands. Most South Asians took residence in the surrounding of The Hague.

South Asians have a high prevalence of insulin resistance, obesity and type 2 diabetes mellitus. [3;15-19] The prevalence of type 2 diabetes is 7-8 times higher among South Asians than in Dutch European persons in The Hague. [20] This was previously noted in other South Asian immigrant populations worldwide in the UK, South Africa, Mauritius and Canada. [15;21-26] This high prevalence of diabetes is not only an immigration problem but also well-known in India due to the increasing living standards. [27]

Not only diabetes but also diabetic complications are more frequent among South Asians than in British European persons. This was first noted for cardiovascular disease, which is more common in the South Asian population, despite a lower prevalence of risk factors like advanced age, smoking, high blood pressure and dyslipidemia. [4;23;28] In the UK, the mortality from circulatory disease in South Asian persons is 1.5 times that

of the general British population. [29] Despite these lower prevalence of risk factors, South Asian diabetic patients have more renal complications. In comparison to British Europeans, the prevalence of microalbuminuria and end-stage diabetic nephropathy was more common in South Asians than in British Europeans. [8;9;30]

A population survey in the UK showed more microalbuminuria in South Asians than in Europeans. [31] After adjustment for age, hypertension and diabetes, South Asians had a higher urinary albumin excretion than Europeans. So, the risk to develop renal injury appears to occur earlier in the course of the disease. Also non-diabetic South Asians have a higher incidence of end-stage renal disease of undetermined cause than British Europeans. [32] Renal biopsy study showed an excess of hypertensive nephropathy, focal segmental glomerulosclerosis and idiopathic interstitial nephritis in non-diabetic South Asians. [33]

It is not clear if these renal problems are associated with the high rate of central obesity in the South Asian population. Central obesity reflected by a high waist-to-hip ratio (WHR) has only recently received attention as a potential risk factor for renal disease in non-diabetic subjects. [34;35] The pathogenesis is unclear and could be mediated primarily by adipogenic inflammation and endothelial dysfunction giving microalbuminuria, or secondarily by hypertension and hyperglycemia which accompany central obesity. [36-38]

Central obesity and insulin resistance are known to be more common in South Asians than in Europeans. [15;18] Moreover, at the same level of WHR, South Asians seem to have increased abdominal visceral fat and greater insulin resistance compared to Europeans. [17] The risk of insulin resistance seems to start early in life. Whincup et al. studied insulin resistance in South Asian children and compared them with white British children. [39] South Asian children were no more obese than those of European origin, but fasting and 30 minute post load insulin were about 50% higher. The SHARE study showed higher fasting blood glucose, cholesterol, systolic blood pressure in South Asians than in Europeans for the same body mass index (BMI) or WHR. [40;41] Even in the normal range, the metabolic markers were still higher in South Asians. It is not known whether this tendency for central obesity could lead to early renal injury and albuminuria before the manifestation of diabetes. This could precede to early diabetic nephropathy and renal failure in the South Asian diabetic patients.

This thesis focuses on the incidence, risk factors and familial predisposition for nephropathy in diabetic and non-diabetic Surinamese South Asian immigrants living in the Netherlands.

Outline of this thesis

Chapter 2 describes the descent of the South Asian immigrants from India to Suriname and the Netherlands, leading to the selection of the study population for the thesis.

Chapter 3 investigates the incidence of end-stage diabetic nephropathy in Surinamese South Asian and the Dutch European population.

Chapter 4 investigates the incidence and progression of diabetic nephropathy in South Asian and Dutch European type 2 diabetic patients.

Chapter 5 investigates familial predisposition for diabetic nephropathy within the South Asian population.

Chapter 6 investigates early renal injury due to central obesity in non-diabetic South Asian subjects.

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