

ABSTRACT

Background:

Diabetes mellitus is a chronic disease with high potential of micro and macrovascular complications. In Malaysia, 61% of dialysis cases are secondary to diabetes. To date, we are still lacking data on the rate of progression of type 2 diabetes mellitus (T2DM) to end-stage renal disease (ESRD) in Malaysia.

Objectives:

The primary objective of this study is to explore the course of ESRD from T2DM in Malaysia and the secondary objective is to compare the differences in rate of progression between patients receiving renin-angiotensin-aldosterone system (RAAS) blockers and those who did not.

Methodology:

This is across-sectional retrospective study conducted in dialysis centre of Hospital Sultanah Bahiyah, Kedah. All diabetic patients who fulfilled the inclusion criteria were identified and recruited for analysis.

Results:

Clinical and laboratory data of 30 patients (15 men, 15 women) were included in the analysis with a median age of 59 ± 14 (IQR) years. Out of the included study population 24 (80%) were Malay and 6 (20%) were Chinese. The mean duration of DM to ESRD was found to be 14.37 ± 4.42 years. Mean duration for the onset of diabetic nephropathy

was 8.73 ± 3.37 years. There was a relative short duration from diabetic nephropathy to ESRD noted, which was 5.63 ± 2.06 years. Only 43.3% of the patients were receiving RAAS blockers at the time of diabetes. The mean duration of DM to ESRD for patients receiving RAAS blockers was found to be 18.23 ± 2.38 years as compared to 11.41 ± 2.94 years for those who did not (95% CI: -0.64 to -2.46). Males were found to progress relatively slower than females (15.1 ± 4.4 vs. 13.6 ± 4.45 years) ($p=0.351$). The Malay race showed relatively faster progression of 13.79 ± 4.1 years compared to 16.6 ± 5.2 years among the Chinese population ($p=0.158$). The mean duration of DM to diabetic nephropathy among patients receiving RAAS blockers was found to be 11.23 ± 2.83 years as compared to 6.82 ± 2.38 years for those who did not (95% CI: -0.63 to -2.458). Males were found to progress relatively slower than females (9.13 ± 3.35 vs. 8.33 ± 3.45 years) ($p=0.525$). The Malay race showed relatively faster progression of 8.21 ± 3.17 years compared to 10.83 ± 3.6 years among the Chinese population ($p=0.088$). While the mean duration of diabetic nephropathy progression to ESRD for patients receiving RAAS blockers was found to be 7.00 ± 1.91 years as compared to 4.59 ± 1.50 years for those who did not (95% CI: -3.688 to -1.135). Males were found to progress relatively slower than females (6 ± 2.1 vs. 5.26 ± 2 years) ($p=0.338$). The Malay race showed relatively faster progression of 5.58 ± 2.14 years compared to 5.83 ± 1.8 years among the Chinese population ($p=0.795$). For different types of RAAS blockers, namely angiotensin converting enzyme inhibitors (ACE-I) and angiotensin receptor blocker (ARB), there was no significant difference observed pertaining to mean duration of DM to ESRD; 17.89 ± 1.97 years for ACE-I and 19.00 ± 4.16 for ARB (95% CI: -4.74 to 2.52). The mean duration of DM to diabetic nephropathy; 11.22 ± 2.537 years for ACE-I and $11.25 \pm$

3.775 years for ARB (95% CI: -3.941 to 3.886) .Meanwhile, the mean duration of diabetic nephropathy to ESRD; 6.667 ± 2.236 years for ACE-I and 7.750 ± 0.5 years for ARB (95% CI: -3.62 to 1.46). It is worth noting that perindopril was the only ACE-I used at doses of 2mg (22.2%), 4mg (33.3%), 6mg (22.2%) and 8mg (22.2%), while losartan was the only used ARB at doses of 25mg (25%), 50mg (25%) and 100mg (50%).

Conclusion:

Time frame from diabetes mellitus to ESRD among Malaysian population was shorter as compared to findings from other countries. RAAS blockers should be initiated early in diabetic patients. There was no statistically significant difference observed in time frame of diabetes mellitus development to end-stage renal disease either by either using angiotensin converting enzyme inhibitors or angiotensin receptor blockers as proteinuria reduction strategy.