Quality of care and volume for patients with diabetes mellitus in the primary care setting: A population based retrospective cohort study

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ABSTRACT

Aims: To examine the association of patient volume with quality of diabetes care in the primary care setting.

Methods: We analyzed population-based data from Hospital Authority administrative database using a Hong Kong representative sample of 187,031 diabetic patients managed in 74 primary care general outpatient clinics between 04/2011 and 03/2012. We assessed the associations between annual clinic-based patient volume and quality of care in terms of adherence to care criteria of process (HbA1c test, renal function test, full lipid profile, urine protein analysis, diabetic retinopathy screening, and appropriate drug prescription) and clinical outcomes (HbA1c $\leqslant$ 7%, BP $\leqslant$ 130/80 mmHg, LDL-C $\leqslant$ 2.6 mmol/L) of care criteria, with and without adjustment for patient and clinic characteristics.

Results: Patient volume was associated with three of seven process of care criteria; however, when compared to clinics in higher volume quartiles, those in lowest-volume quartile had more odds of HbA1c test (odds ratios (OR): 0.781, 0.655 and 0.646 for quartile from 2 to 4, respectively), renal function test (OR: 0.357, 0.367 and 0.590 for quartile from 2 to 4, respectively), and full lipid profile test (OR: 0.508, 0.612 and 0.793 for quartile from 2 to 4, respectively). There was no significant association between patient volume and the standards of achieving of HbA1c, BP and LDL-C outcome targets.

Conclusions: Disparities in volume and quality of diabetes care were observed in public primary care setting. Lower patient volumes at clinic level were associated with greater adherence to three process criteria but a volume–outcome association was not present.

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1. Introduction

Disease and economic burden of diabetes mellitus have risen worldwide [1,2]. Owing to increased burden and health service needs, diabetes care in primary care plays an even more essential role of prevention and detection of diabetes-related complications. Therefore the monitoring, assessment and management of the quality of diabetic care is crucial in order to achieve an effective health system [3].

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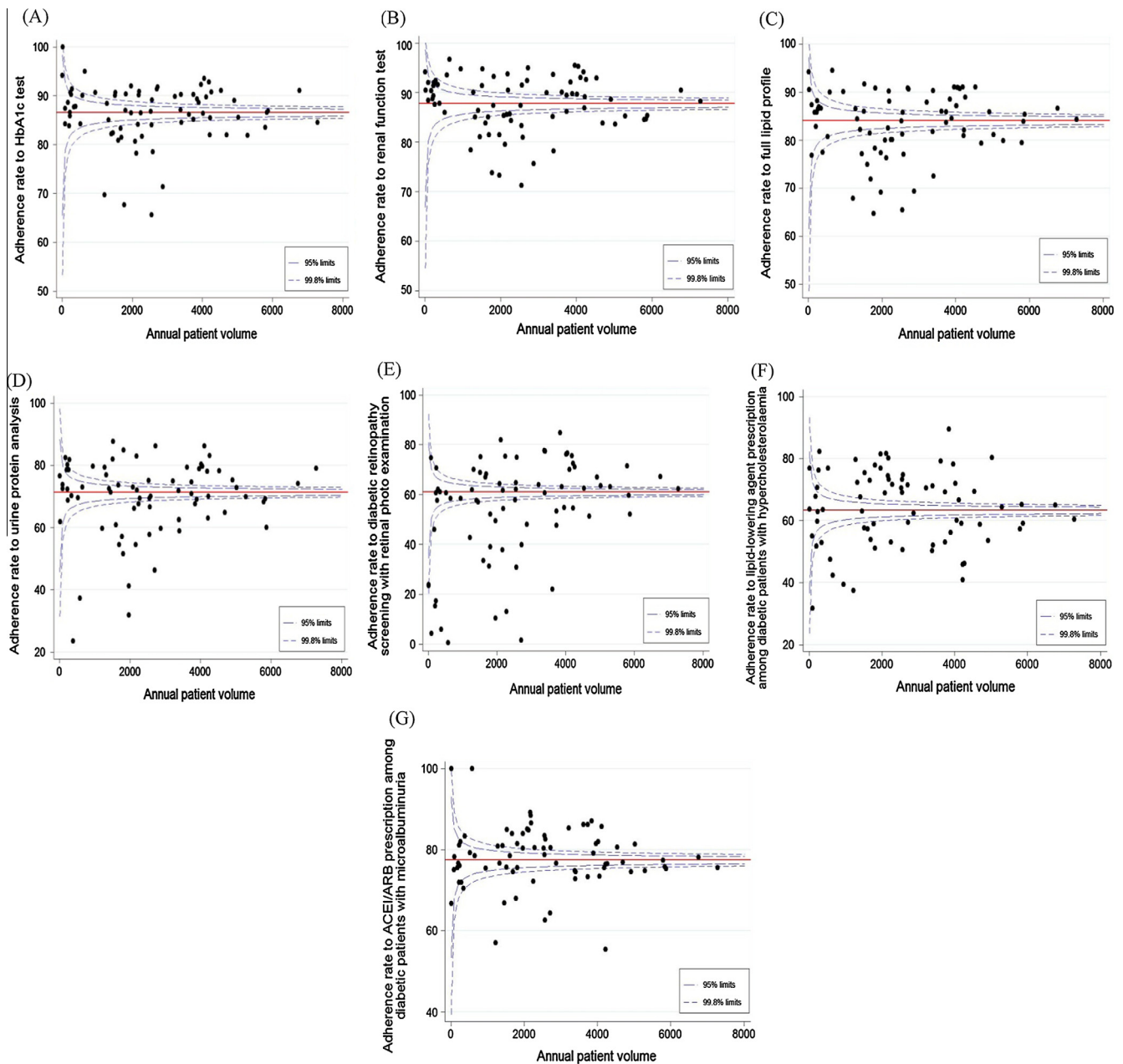E-mail address: carlosho@hku.hk (C.K.H. Wong).

Fig. 1 – Funnel plots of process of care criteria by annual patient volume: (A) annual hemoglobin A1c (HbA1c) test, (B) annual renal function test, (C) annual full lipid profile, (D) annual urine protein analysis, (E) diabetic retinopathy screening with retinal photo examination; (F) lipid-lowering agent prescription among diabetic patients with hypercholesterolaemia, and (G) angiotensin converting enzyme inhibitor/angiotensin receptor blocker (ACEI/ARB) prescription among diabetic patients with microalbuminuria. Funnel plots of outcomes of care criteria by annual patient volume: (H) HbA1c ⩽ 7%, (I) blood pressure (BP) ⩽ 130/80 mmHg, and (J) low density lipoprotein-cholesterol (LDL-C) ⩽ 2.6 mmol/L.

On the basis of existing data, association between patient volume and quality of care (volume–quality association) has been well-established for policy implication in hospital-based secondary care setting [4–6]. Systematic review [7] of enormous observational studies clearly demonstrated that increasing in the patient volume, whether at the level of hospital or physician, resulted in a significant improvement in quality of care with respect to process and outcomes of care. Despite considerable evidence in hospital-based setting, such association was not often transferable to primary care settings [8,9].

To date, there has been increasing attention for improving the quality of diabetes care in primary care, given its known benefits to reduce unplanned admission due to diabetes-related complications [10]. At a clinic level, volume of diabetic patients (or practice size) has expanded steadily with the growing incidence of diabetes and detection of undiagnosed diabetes in a scarce-resource primary care setting over the