Quality improvement for early detection and management of insulin resistance for healthy aging in older adults with type 2 diabetes in primary care

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ABSTRACT

Introduction: Insulin resistance (IR) is the essential underlying mechanism of type 2 diabetes mellitus (T2DM) and significantly contributes to metabolic decline in aging population. In Malaysia, the burden of T2DM is rising among adults over 60, often progressing silently. Insulin resistance in this group is linked to cardiovascular disease, cognitive decline, and frailty. Yet, early detection and targeted interventions, including comprehensive geriatric assessment (CGA), remain limited in many healthcare settings. Proactive measures at the primary care level could slow disease progression while promoting healthy aging. This project proposes a quality improvement (QI) initiative to enhance early detection and management of insulin resistance among older adults (≥60 years) with or at risk of T2DM in primary care. The goal is to promote healthy aging by integrating structured screening, lifestyle intervention, and education into primary care. **Materials and Methods:** This QI initiative should adopt the Plan-Do-Study-Act (PDSA) cycle as a framework. Suggested steps include: (1) Training healthcare professionals and staffs on IR, its markers, its link to aging-related diseases and CGA which covers on physical, psychological, functional and social domains among older persons, (2) Developing a better screening checklist for IR using practical indicators like clinical features of IR including acanthosis nigricans, triglyceride-glucose (TyG) index ratio, family history of diabetes, along with microvascular and macrovascular complications of diabetes in addition to current parameters checklist in the non-communicable diseases (NCD) book which has already included vital signs, waist circumference, body mass index (BMI), HbA1C and foot examination. (3) Incorporating lifestyle counselling protocols using the 5As model (Assess, Advise, Agree, Assist and Arrange) tailored for older persons. (4) Providing patient education materials in Malay and English to improve understanding of IR, healthy diet, and physical activity. The intervention was initially piloted in one primary care clinic among four patients with underlying of various comorbidities where the outcome indicators such as increased documentation of IR markers, improved counselling rates, and patient-reported lifestyle changes. **Acknowledgement:** This spin-off proposal was conceptualised by the authors and supported in part by resources and data from the Dietary Intake, Insulin Resistance, and Glycaemic Control of Adults with Type 2 Diabetes Mellitus in Malaysia, with a Comparison to Healthy Volunteers – A Pilot DIRG Study funded by NUMed Internal Research Grant 2024 Code: 226900-IG19. **Results:** The project is expected to raise awareness and improve early detection of IR, enhance patient engagement through lifestyle counselling and CGA, support metabolic improvements, and empower patients to practice healthy ageing. If successful, the model can be scaled up to other primary care settings including Klinik Kesihatan and potentially integrated into existing NCD management protocols under the Family Doctor Concept (FDC) in Malaysia. **Conclusion:** This quality improvement proposal highlights a practical and scalable approach to managing insulin resistance in older adults. By focusing on early detection and lifestyle modification, it aligns with national priorities to combat NCD and promote healthy aging. This initiative can bridge the gap between clinical diabetes management and preventive geriatric care, ultimately improving quality of life and reducing long-term healthcare burden.

Keywords: Insulin resistance, older persons, Triglyceride-Glucose Index Ratio, comprehensive geriatric assessment