

UNIVERSITI TEKNOLOGI MARA

**THE PREVALENCE AND FACTORS
ASSOCIATED WITH UNDIAGNOSED
DYSGLYCAEMIA IN ESTABLISHED
RHEUMATOID ARTHRITIS**

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AUTHOR'S DECLARATION

I declare that the work in this thesis was carried out in accordance with the regulations of Universiti Teknologi MARA. It is original and is the result of my own work, unless otherwise indicated or acknowledged as referenced work. This thesis has not been submitted to any other academic institution or non-academic institution for any degree, qualification or academic award.

I hereby, acknowledge that I have been supplied with the Academic Rules and regulations for Post Graduates, Universiti Teknologi MARA, regulating the conduct of my study and research.

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ABSTRACT

Background: Rheumatoid arthritis is a chronic inflammatory disease with an increased risk of diabetes and insulin resistance. **Aims:** To determine the prevalence of undiagnosed dysglycaemia and investigate the factors associated with it in patients with established RA. **Methods:** This was a cross-sectional study conducted in a rheumatology centre. One hundred fifty five consecutive patients were recruited. The inclusion criteria were patients with established RA, age ≥ 30 years. Patients with diabetes or pre-diabetes were excluded. Demographic details, clinical data on RA and anthropometric measurements were obtained. Laboratory investigations performed included erythrocyte sedimentation rate, C-reactive protein, intracellular adhesion molecule (ICAM), lipid profile and plasma glucose. A 75g-oral glucose tolerance test was performed to determine dysglycaemia. Comparison of variables were done between two groups; dysglycaemia and normoglycaemia. **Results:** The mean age of patients was 57.2 ± 8.1 years and majority (87.7%) were female. 35.5% (n=155) had dysglycaemia. Apart from ever smoker, there were no significant differences observed in age, gender and disease duration between the groups. Although RA disease activity and the average dose of corticosteroid used within six months were higher in dysglycaemia group, the differences were not statistically significant. Significant differences were observed in waist circumferences, weight, systolic and diastolic blood pressure, high-density lipoprotein, triglycerides and ICAM levels but after multivariate analysis, the predictors of dysglycaemia were ever smoker and high triglyceride level. **Conclusion:** One-third of our patients had dysglycaemia and they were heavier, larger waist circumference, higher blood pressure and LDL-c, and lower HDL-c. Predictors of dysglycaemia in established RA aged ≥ 30 years were ever smoker (OR 4.28) and high triglyceride level (OR 3.29).

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CHAPTER ONE

INTRODUCTION

1.1 RESEARCH BACKGROUND

Rheumatoid arthritis (RA) is a chronic progressive inflammatory autoimmune disease, mainly affecting the joints. The clinical symptoms of the disease varied from mild self-limited disease to severe joint destruction and physical disability (Plenge, 2009). Apart from increased morbidity due to physical disability, RA patients have been shown to have more than twice mortality rates compared to the general population (Gonzalez et al., 2007). Cardiovascular disease (CVD) is a significant cause of mortality in patients with RA (Wolfe et al., 1994) and in a population-based cohort study, the incidence of CVD in patients with RA is at least equal to that observed for type 2 DM (T2DM) (Rho et al., 2009). The cause of the excess cardiovascular risk in patients with RA is multifactorial; apart from ongoing high-grade inflammation (Rho et al., 2009), T2DM has also been shown to contribute to the cause of increased cardiovascular risks (Choy, Ganeshalingam, Semb, Szekanecz, & Nurmohamed, 2014; Kitas & Gabriel, 2011).

Several studies have shown that patients with RA have higher risks of diabetes and insulin resistance (IR) (Solomon, Love, Canning, & Schneeweiss, 2010; Su, Chen, Young & Lian, 2013; Ursini et al., 2016). The elevated risk of developing diabetes in RA was initially thought to be due to the chronic use of corticosteroid (Caldwell & Furst, 1991). However recent study proposed that development of T2DM in RA is irrespective of glucocorticoids use (Solomon et al., 2010). The ongoing inflammation in RA, evidenced by elevated C-reactive protein (CRP), interleukin-6 (IL-6) and tumour necrosis factor- α (TNF- α) have been shown to be associated with the development of diabetes (Goldberg, 2009; Wang et al., 2013). These inflammatory markers are often raised in patients with RA especially during active disease and are commonly elevated many years before the clinical manifestation of RA (Steenbergen, Huizinga, & Helm-van Mil, 2013).