OPEN ACCESS Freely available online

ISSN: 2572-5629
Diabetes Case Reports

Short Communication

Prevalence of Dietary Risk Factors of Chronic Kidney Disease among the Individuals with Type 2 Diabetes

Hamid Yimam Hassen*

Department of Medicine and Health Sciences, University of Antwerp, Antwerp, Belgium

ABSTRACT

During the last decade, there has been a rising interest in the epidemiology of Chronic Kidney Disease (CKD), which is now recognized as an important public health problem worldwide. Patients with CKD are at high risk for progression to End Stage Renal Disease (ESRD); a condition often requiring costly renal replacement therapy in the form of dialysis or transplantation. Although over 2 million people now require chronic renal replacement therapy worldwide, only a minority of patients who are at risk for developing ESRD are under medical attention. Moreover, CKD is associated with eight- to ten-fold increased risk of Cardiovascular Disease (CVD) mortality. Other complications include acute kidney injury, increased risk of infection, cognitive decline, anaemia, mineral and bone disorders and fractures.

Keywords: Chronic kidney disease; Diet; Lifestyle; Mortality; Prediction; Model; Risk score; Low birth weight; Pregnant women; Decision curve analysis

INTRODUCTION

The economic impact of CKD is enormous, whether related to direct healthcare cost or to indirect productivity lost with profound consequences on the quality of life of the individual, his family and society [1]. Recently, the global burden of diseases, Injuries and risk factors study (GBD) ranked low Glomerular Filtration Rate (GFR) as the 12th leading risk factor for death at the global level and the 14th risk factor for Disability-Adjusted Life-Years (DALYs) among 79 risk factors in 2013. In the past decade, attention has moved from treating only advanced stages of CKD toward prevention at earlier stages of CKD. However, due to the asymptomatic nature of slowly progressing renal damage, CKD is frequently undetected until the very late stages, with few opportunities for prevention. Therefore, focusing efforts on early detection and treatment of CKD can prevent or delay progress to kidney failure or other adverse outcomes [2].

Chronic Kidney Disease (CKD) arises when one or both of the following conditions are present

When there is evidence of kidney damage lasting for at least 3 months, as defined by structural or functional abnormalities of the kidney with or without a decreased Glomerular Filtration Rate (GFR), as demonstrated either by pathologic abnormalities or by markers of kidney damage, including urine or blood abnormalities or abnormalities noted on imaging and When the GFR is less than 60 ml/min/1.73 m2 for at least 3 months with or without kidney damage.

At least one ultrasound is recommended to predict fetal growth restriction and low birth weight earlier in pregnancy. However, in low-income countries, imaging equipment and trained manpower are scarce. Hence, we developed and validated a model and risk score to predict low birth weight using maternal characteristics during pregnancy, for use in resource limited settings. We developed the model using a prospective cohort of 379 pregnant women in south Ethiopia. A stepwise multivariable analysis was done to develop the prediction model. To improve the clinical utility, we developed a simplified risk score to classify

Correspondence to: Hamid Yimam Hassen, Department of Medicine and Health Sciences, University of Antwerp, Antwerp, Belgium; E-mail: albdulhamidy71@gmail.com

Received: 05-Aug-2020, Manuscript No. DCRS-24-5911; **Editor assigned:** 10-Aug-2020, PreQC No. DCRS-24-5911 (PQ); **Reviewed:** 24-Aug-2020, QC No. DCRS-24-5911; **Revised:** 01-Aug-2024, Manuscript No. DCRS-24-5911 (R); **Published:** 29-Aug-2024, DOI: 10.35841/2572-5629.24.9.218

Citation: Hassen HY (2024) Prevalence of Dietary Risk Factors of Chronic Kidney Disease among the Individuals with Type 2 Diabetes. Diabetes Case Rep. 9:218.

Copyright: © 2024 Hassen HY. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

pregnant women at high- or low-risk of low birth weight [3]. The accuracy of the model was evaluated using the area under the receiver operating characteristic curve (AUC) and calibration plot. All accuracy measures were internally validated using the bootstrapping technique. We evaluated the clinical impact of the model using a decision curve analysis across various threshold probabilities. Age at pregnancy, underweight, anemia, height, gravidity and presence of comorbidity remained in the final multivariable prediction model. The AUC of the model was 0.83 (95% confidence interval: 0.78 to 0.88). The decision curve analysis indicated the model provides a higher net benefit across ranges of threshold probabilities. In general, this study showed the possibility of predicting low birth weight using maternal characteristics during pregnancy. The model could help to identify pregnant women at higher risk of having a low birth weight baby. This feasible prediction model would offer an opportunity to reduce obstetric-related complications, thus improving the overall maternal and child healthcare in low-and middle-income countries [4].

DESCRIPTION

LBW has a remarkable impact on the political, social, economic and healthcare system in LMICs. Hence, by the end of 2025, the world health assembly set a policy target to reduce LBW by 30%. Strategies have been implemented with given emphasis on the packages of care provided at the prenatal, ante-natal, intra-natal, and post-natal period. As a result, the proportion of mothers Attending Antenatal Care (ANC) is improving. As part of the strategy, it is essential to diagnose or predict fetal growth restriction earlier in pregnancy to take appropriate measure for high risk groups. However, in LMICs, imaging equipment and trained manpower are limited. It is assumed that a simple prediction tool could be an alternative in resource-poor settings [5]. However, no significant clinical attempt has been made to predict the probability of LBW. To our knowledge, two studies tried to develop a prediction model, although they had less practical implication because the predictors used are not easily obtainable in primary healthcare settings. We developed and validated a model and risk score to predict LBW in primary care settings of LMICs. The risk scores could be used by clinicians and public health professionals working on maternal and child health unit to predict LBW earlier in pregnancy.

Low Birth Weight (LBW), a weight at birth of less than 2500 g (5.5 lb), continues to be a significant public health problem globally. It is estimated that 15% to 20% of all births worldwide are LBW, accounting for more than 20 million in a year [6]. The rate of LBW varies considerably among regions and countries, with higher burden among Low- and Middle-Income Countries (LMIC). The prevalence in LMICs (16.5%) is twice higher than in high-income countries (7%). In Ethiopia, LBW rate ranges from 8% to 54%, showing a huge variation across geographical settings and time periods. A recent systematic review showed a pooled estimate of 17.3% in Ethiopia, which implies it still remains an important public health problem in the country.

LBW or being small for gestational age increases infant morbidity and mortality. It is related to childhood health outcomes, such as susceptibility to infection, neurological deficits and lower cognitive skills. Later in life, it is associated with high blood pressure, diabetes and coronary heart disease [7]. In 2016, the infant mortality rate in Ethiopia was 48 deaths per 1000 live births of which a significant proportion was attributed to LBW. Demographic factors such as young maternal age, higher birth order, prim-gravida, low educational level and poor maternal nutritional status before and during pregnancy are well recognized risk factors for LBW. Numerous other determinants have also been associated with intrauterine growth retardation, such as rural residence, poor diet, anemia, parity and presence of chronic illness. Socioeconomic factors including household income and level of education have also been suggested [8].

CONCLUSION

This study shows the possibility of predicting LBW using a simple prediction model constructed from maternal characteristics. The prediction score will help to do a risk stratification of pregnant women and to identify those at higher risk of having an LBW baby. Subsequently, high-risk groups can be linked to a centre, which is equipped with ultrasound facilities for further assessment and better management during pregnancy, delivery and post-natal period. Hence, this feasible prediction score would offer an opportunity to reduce neonatal complications related with low birth weight and thus improving the overall maternal and child healthcare. We strongly recommend validating the prediction tool in another context before introducing it to the clinical and public health practices, preferably using real-world data.

REFERENCES

1. Dunkler D, Kohl M, Teo KK, Heinze G, Dehghan M, Clase CM, et al. Dietary risk factors for incidence or progression of chronic kidney disease in individuals with type 2 diabetes in the European union. Nephrol Dial Transplant. 2015;30:76-85.
2. Jitraknatee J, Ruengorn C, Nochaiwong S. Prevalence and risk factors of chronic kidney disease among type 2 diabetes patients: A cross-sectional study in primary care practice. Sci Rep. 2020;10(1): 6205.
3. Nazzal Z, Hamdan Z, Masri D, Abu-Kaf O, Hamad M. Prevalence and risk factors of chronic kidney disease among Palestinian type 2 diabetic patients: A cross-sectional study. BMC Nephrol. 2020;21(1): 484.
4. Asghari G, Momenan M, Yuzbashian E, Mirmiran P, Azizi F. Dietary pattern and incidence of chronic kidney disease among adults: A population-based study. Nutr Metab. 2018;15:88.
5. Dunkler D, Kohl M, Heinze G, Teo KK, Rosengren A, Pogue J, et al. Modifiable lifestyle and social factors affect chronic kidney disease in high-risk individuals with type 2 diabetes mellitus. Kidney Int. 2015;87(4):784-791.
6. McClellan WM. Epidemiology and risk factors for chronic kidney disease. Med Clin North Am. 2005;89(3):419-445.
7. Lin CY, Hsieh MC, Kor CT, Hsieh YP. Association and risk factors of chronic kidney disease and incident diabetes: A nationwide population-based cohort study. Diabetologia. 2019;62(3):438-447.
8. Guo C, Lin Y, Wu S, Li H, Wu M, Wang F. Association of the Dietary Inflammation Index (DII) with the prevalence of chronic kidney disease in patients with type-2 diabetes mellitus. Ren Fail. 2023;45(2):2277828.