

2022 Best Research Poster Award

Investigating the transition between glycaemic states: an individual participant data meta-analysis of 79,058 individuals

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INTRODUCTION

Prediabetes is the sub-clinical stage of type 2 diabetes mellitus (T2DM) and is characterised by blood glucose levels that are higher than normal levels, but not sufficiently high to meet the criteria for T2DM definition.

374 Million adults are living with prediabetes (1)

450 Million adults with prediabetes in 2030 (1)

OBJECTIVES

Considering the high and increasing burden of T2DM and prediabetes it seems crucial to assess the sex-age-specific prediabetes transition rates.

METHOD

We conducted a two-step individual participant meta-analysis using longitudinal data included in the Obesity, Diabetes and Cardiovascular Disease Collaboration. Of the 117,451 participants, we excluded 38,393 participants with missing information as well as newly diagnosed T2DM at baseline. Finally, we included 79,058 participants with normoglycaemia or prediabetes at baseline with available data on glycaemic status from at least one follow-up. Fasting plasma glucose, serving as the criterion to assess the glycaemic state based on the American Diabetes Association guidelines (2). Figure 1 shows three glycaemic states (Normoglycemia(NG), prediabetes(Pre-DM), and T2DM) and six possible transitions between these states. We estimated the sex-age-specific transition probability rates among these states using the multi-state Markov model.

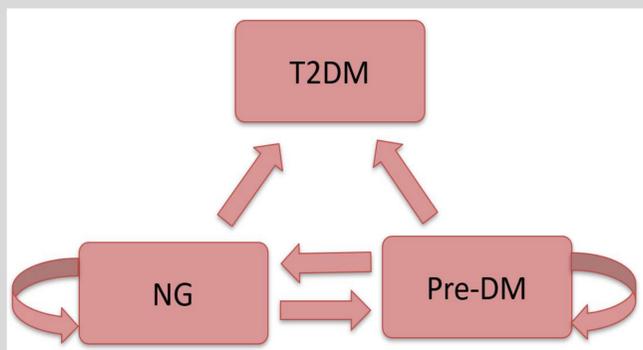


Figure 1 Schematic diagram of prediabetes transitions; NG, normoglycaemia; Pre-DM, prediabetes; T2DM, Type 2 Diabetes Mellitus

RESULTS

In our study; 52.9% were women (mean age 51.2 years) and 47.1% were men (mean age 51.1 years). The observed prediabetes progression frequency to T2DM is increased over time. Men and aged 55 years and older evidenced a more progression trend in comparison with women and younger adults. Moreover, the T2DM incidence in the tenth year of follow-up is almost two times higher than in the fifth year (Figure 2).

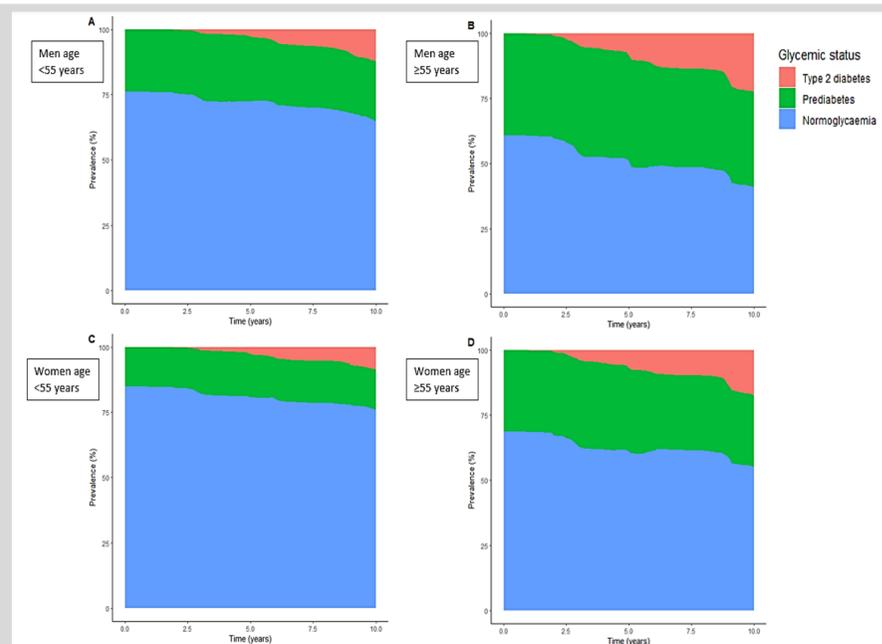


Figure 2 Observed transition patterns in Men age <55 years, Men age ≥55 years, Women age <55 years, Women age ≥55 years

Figure 3 shows the estimated prediabetes progression probabilities toward T2DM and regression probabilities to normoglycaemia and its 95% confidence interval over 10 years. It also shows the estimated mean sojourn time (MST), the mean length of stay at each state, by year in prediabetes state and 95% confidence interval.

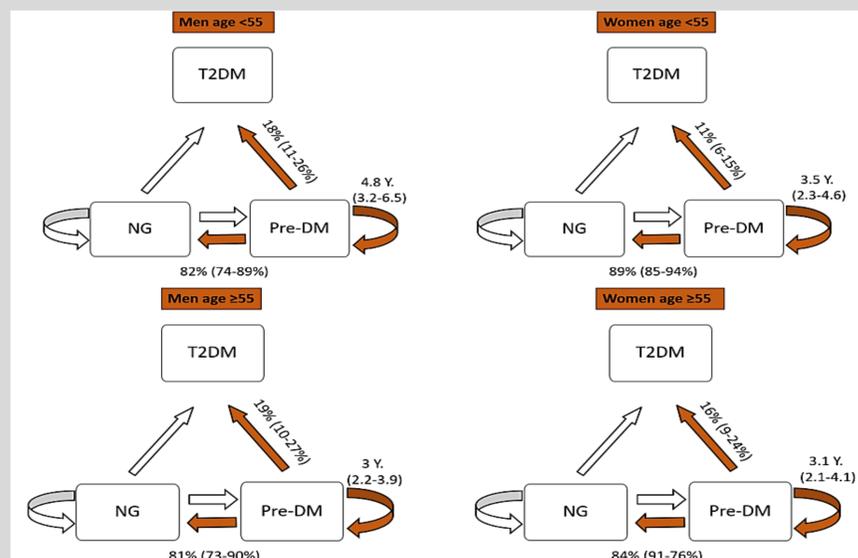


Figure 3 Prediabetes state transitions probability and the mean sojourn time

DISCUSSION

The prediabetes transition probability to the normoglycemia is higher than its progression toward T2DM. Men population and aged 55 years and older evidenced a more progression trend in comparison with women and younger adults. Accordingly, considering this high regression probability to normoglycemia, more can be done to prevent progression.

CONCLUSION

In a nutshell, the estimated transition probabilities and MST for prediabetes state could provide much-needed information for the medical organization's protocol in planning for and improving the conditions of people with T2DM.

REFERENCES & ACKNOWLEDGEMENTS

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