EXPLORING DEPRESSION IN A SOUTH ASIAN POPULATION AT HIGH RISK OF TYPE 2 DIABETES
Depression and diabetes are closely linked, through a bidirectional relationship. A new study finds a higher level of depressive symptoms among a South Asian population drawn from Type 2 diabetes prevention programmes in Leicestershire in comparison with their White European counterparts. The findings have important implications for the design and development of Type 2 diabetes prevention initiatives to improve engagement and retention in the future.

Depression is common among people with Type 2 diabetes and the relationship between the two conditions is thought to be bidirectional. There is plenty of research into levels of depression in both the general and Type 2 diabetes populations. However, less is known about how these findings might apply to minority populations. What we do know is that South Asian people, especially those living in higher income countries like the UK are at increased risk of Type 2 diabetes and cardiovascular disease. Thus, because of the bidirectional link between depression and Type 2 diabetes, South Asians could also be at greater risk of depression. There is already some evidence that migrant South Asian populations experience more issues with their mental health than White Europeans. However, we do not know how the association between South Asian ethnicity and higher levels of depression might be confounded or impacted by health, socio-economic status, lifestyle or environment.

A new study, from researchers at the University of Leicester’s Diabetes Research Centre, and elsewhere, set out to explore this issue. The authors compared levels of depressive and anxiety symptoms in South Asians and White Europeans in Type 2 diabetes prevention programmes, and whether differences were independent of clinical, sociodemographic, lifestyle and environmental factors. A further aim was to examine the relationship between these factors and depressive and anxiety symptoms, and whether these are modified by ethnicity.

**Study participants**

People taking part in the study were drawn from two Type 2 prevention trials taking place in Leicestershire, with data being collected at baseline, 12, 24 and 36 months. In the Walking Away from Diabetes trial, 808 adults were recruited from 10 general practices. Aged between 18 and 74 years, they had been identified by the Leicester Risk Score as being at high risk of impaired glucose regulation or undiagnosed Type 2 diabetes. They were then ranked for diabetes risk via their medical records. Those scoring in the 90th centile were invited into the Walking Away study, which was a randomised controlled trial testing the effectiveness of a structured education programme aiming to promote more walking.

The Let’s Prevent Diabetes trial recruited 880 adults from 44 general practices. They were aged 40 to 75 years, if White European, and 25 to 75, if South Asian. They were invited onto the trial on the same basis as the participants in the Walking Away study. Let’s Prevent Diabetes was a randomised controlled trial testing the effectiveness of a structured education programme intended to promote walking, a healthy diet and weight loss.

**Study procedure**

The Hospital Anxiety and Depression Scale (HADS) was administered to participants at baseline, 12, 24 and 36 months. Sociodemographic and health data were gathered by questionnaire. Body weight, height and HbA1c were also measured. Deprivation level was recorded by assigning the Index of Multiple Deprivation score to participant postcodes. Pedometers were used to measure level of physical activity.

The researchers also included environmental factors as covariates. These were neighbourhood green space, proximity to fast food outlets and levels of air pollution.

Data from the Walking Away and Let’s Prevent studies were pooled. Four different models were created, ranging from unadjusted to fully adjusted for all the factors mentioned above and statistical analysis applied. The models were mutually adjusted to determine which factors were independent correlates of depressive and anxiety symptoms.

**Results**

Overall, 90% of participants were White European and 10% South Asian, the vast majority of whom described themselves as Indian. The South Asian participants had substantially higher levels of social deprivation in comparison with the White Europeans. The South Asians were also younger, had higher HbA1c, greater exposure to air pollution, had less access to green space and were surrounded by more fast-food outlets. South Asian women had the highest prevalence of mild-to-severe anxiety symptoms (35.4%), while White European men had the lowest prevalence (19.6%).

Unadjusted HADS scores were 1.5 units higher in South Asian compared with White European participants; and these results were not affected after adjusting for clinical, sociodemographic, lifestyle or environmental factors. The odds ratios for mild-to-severe depression risk were also higher in South Asian compared with White European participants at 2.81. These results were also not affected after adjusting for clinical and other factors mentioned above.

When it came to anxiety, there was no difference between South Asians and white Europeans once the factors above were taken in account. The unadjusted odds ratio for mild-to-severe anxiety risk in South Asians compared with White Europeans was 1.52, but this was attenuated in the fully adjusted model.

Individual correlates of depressive symptoms were social deprivation, BMI, and...
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fast-food outlets and level of physical activity. None of these associations were modified by ethnicity. Similarly, anxiety was linked to age, sex, social deprivation, BMI and HbA1c.

**Discussion**

This new study has found that South Asians at high risk of Type 2 diabetes have higher levels of depressive symptoms than their white counterparts. These higher levels were not explained by differences in HbA1c, physical activity, social deprivation, air pollution or their physical environment. Levels of anxiety symptoms were also higher among South Asians.

These new findings differ from some previous research on ethnic differences in depression. For instance, one study found no difference between White Europeans and South Asians with normal glucose tolerance, impaired glucose tolerance and Type 2 diabetes. Another study found higher levels of depression among the general South Asian population, but these differences were mainly attenuated after adjusting for differences in physical health. The new results are, however, consistent with a study showing the prevalence of depressive symptoms to be higher among British South Asian individuals and another that shows that South Asian men report being more depressed than White European men.

Social factors could explain the findings of this study. Participants were older and more likely to be first-generation migrants, so issues surrounding migration may be involved in their higher risk of depression. Other factors might include lack of opportunity for upward social mobility, discrimination, poor language skills and leaving native homelands. Such factors might increase stress and social isolation, potentially leading to depression.

The authors also suggest that misconceptions about mental health can occur in South Asian communities. This may result in people not seeking the help they need. Indeed, it is already known that people from minority ethnic backgrounds, including South Asians, use mental health services less than White Europeans do. All these factors need to be taken into account when designing Type 2 diabetes prevention services.

**Implications of this study**

The finding that South Asians at high risk of Type 2 diabetes have an increased propensity to depression have clear implications for diabetes prevention services. We already know that people living with depression are less likely to use diabetes healthcare services and are more likely to report difficulties in accessing these services. Unsurprisingly, depression is also linked to increased difficulties with diabetes self-care. When it comes to prevention, it is also likely that depression may result in an individual being less likely to get involved with projects like Walking Away, Let’s Prevent and, indeed, Healthier You: the NHS Diabetes Prevention Programme and, of course, Awareness to Action, which is discussed in our cover feature. Therefore, integrating depression screening and treatment into Type 2 diabetes prevention, with a focus on minority groups, like South Asians, may well improve engagement and success rates. Further investigation into this area is warranted.

A key finding from this study is that social deprivation, BMI, fast-food outlet availability and low levels of physical activity were all linked to depressive symptoms, irrespective of ethnicity. Also, age, sex, social deprivation, BMI and HbA1c were associated with anxiety. So, the correlates of depression and anxiety are similar regardless of ethnicity. One practical way forward could be to develop more interventions to increase physical activity, which has already been shown to be as effective as medication in treating depression, for some. More attention should also be given to the negative impact of air pollution, lack of green space and social deprivation on mental health.

The main limitation of this study is that the HADS might not be culturally relevant to the South Asian population. The questionnaire may need to be adapted and validated in this group. There might also have been some language barriers limiting understanding of the HADS, even though all participants did speak English. Furthermore, the term ‘South Asian’ covers a wide range of cultures, languages and religions. Most participants here were of Indian origin and the result might not apply to all South Asian populations.

This study focused upon individuals at high risk of Type 2 diabetes and so might not be representative of the wider population. While many factors were included in the research, genetic factors may also contribute to increased risk of depression among South Asian people, especially as depression and Type 2 diabetes may share some common cause. Research to date has identified one predictor as being geneticrend, and this has already been shown to be as effective as medication in treating depression, for some. More attention should also be given to the negative impact of air pollution, lack of green space and social deprivation on mental health.

In conclusion, this study finds that South Asians at high risk of Type 2 diabetes may be more likely to report depression than White Europeans, irrespective of various clinical, sociodemographic, lifestyle and environmental factors. Further investigation is called for, including whether depression affects South Asians’ engagement and retention in Type 2 diabetes prevention programmes. It may be worthwhile looking at developing culturally appropriate interventions for treating depression as part of such programmes.
BRINGING CREDENCE TO THE MANAGEMENT OF KIDNEY DISEASE

Update brings you Journal Club – a series where we highlight the new key peer-reviewed papers that could influence your clinical practice. Dr Florence Johnson, Improving Care Manager (London region), Diabetes UK, discusses a milestone paper on the benefits of canagliflozin on people with diabetes and kidney disease.

Following our diabetes and kidney guideline pull-out in the Summer issue of Update, we wanted to report on the findings of the Phase 3 CREDENCE (Canagliflozin and Renal Events in Diabetes with Established Nephropathy Clinical Evaluation) trial, published in April this year in the New England Journal of Medicine. The double-blind, randomised, placebo-controlled clinical trial assessed the effects of the sodium glucose cotransporter-2 (SGLT-2) inhibitor canagliflozin (Invokana, Janssen Pharmaceuticals) on renal outcomes in patients with Type 2 diabetes and albuminuric chronic kidney disease (CKD). A total of 4,401 patients with an estimated glomerular filtration rate (eGFR) of 30 to <90mL/min/1.73m² and albuminuria (>300 to 5,000) received 100mg oral canagliflozin daily or placebo, with a median follow-up of 2.62 years.

CREDENCE was performed in a higher renal risk population (lower eGFR, higher albuminuria) than previously studied in trials such as DECLARE, CANVAS and EMPA-REG OUTCOME. Following planned interim analysis, CREDENCE was ended prematurely due to positive findings.

In patients with Type 2 diabetes and kidney disease, canagliflozin reduced the risk of the primary end point of the study, a composite of end-stage kidney disease (ESKD), doubling of serum creatinine, or cardiovascular or renal death by 30% compared with current standard of care. In addition, canagliflozin reduced the risk of an important secondary outcome of the renal-specific composite of ESKD, doubling of serum creatinine and renal death by 34%. The study also found no significant increase in the risk of amputation or fractures in patients receiving canagliflozin, and the side effects observed were consistent with previous canagliflozin studies.

Positive cardiovascular outcomes for SGLT-2 inhibitors have previously been reported. The significantly lower rates of cardiovascular events in people with Type 2 diabetes in the canagliflozin arm of the CREDENCE trial were consistent with the results of the CANVAS (Canagliflozin Cardiovascular Assessment Study) trial, published in 2017. Other SGLT-2 inhibitor trials include EMPA-REG OUTCOME, which showed a reduction in cardiovascular risk and improved overall survival in adults with Type 2 diabetes and cardiovascular disease with empagliflozin, and DECLARE-TIMI 58, which showed lower event rates for both cardiorenal and renal-specific outcomes for dapagliflozin.

Dr Peter Winocour, Consultant Physician and Clinical Director for Diabetes and Endocrine Services at East and North Hertfordshire NHS Trust writes: “We are definitely at a point now where we can reasonably state we have a new class of therapy that benefits renal function in Type 2 diabetes. The demonstrable benefit of gliflozins at a lower eGFR than currently licensed justifies regulatory approval.”

In conclusion, the results for patients with diabetic kidney disease (DKD) are promising. Since the only currently approved therapy for renoprotection is renin-angiotensin system blockade, this new trial is significant, considering the increasing numbers with diabetes and advanced CKD. Preventing or delaying the progression of DKD to ESKD with canagliflozin in the appropriate patient population could have substantial cost savings for the NHS. More importantly, potential delays to ESKD and, therefore, renal replacement therapies may give those with DKD better quality of life for that much longer.

REFERENCES: