Effects of ageing and type 2 diabetes on attention in the middle-aged to older adult population

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BACKGROUND

• Attention is an aspect of cognition that involves the ability to focus selectively on a particular stimulus, whilst disregarding other irrelevant information. There are three distinct networks of attention: 1) Alerting; 2) Orienting; and 3) Executive control.

• There is a lack of research investigating the impact of chronological age on attentional changes within the middle-aged to older adult population.

• Cognitive decline is a recognised complication of type 2 diabetes mellitus (T2DM).

• The Attention Network Test (ANT) is a cognitive test to measure attention,1 however, there is limited evidence of its robustness when conducted remotely.

• Previous literature investigating the impact of T2DM on attention has yielded inconsistent findings.2-4

AIMS

Aim: To assess the effects of ageing and T2DM on attentional performance in the middle-aged to older adult population aged 50-75 years.

Secondary aims:

• To examine the individual effects of age and T2DM on each attentional network.

• To assess the robustness of running the Attention Network Test (ANT) remotely.

METHOD

• 104 participants aged 50-75 years were recruited through Prolific, an online recruitment platform, of which 50 had a self-reported T2DM diagnosis.

• The ANT, along with the collection of demographic details and the completion of four questionnaires (or five if a diagnosis of T2DM was present) was administered on the Gorilla platform.

• Using the SPSS package, an extensive 2 (diabetes group) x 3 (congruency type) x 4 (cue type) mixed plot ANOVA model was implemented, with age as a 5-level covariate.

• The main effects and interaction effects for the four variables were assessed using the RTs of ANT trials.

RESULTS

• The type of cue displayed before the target arrow had a significant effect on the mean RT (p=0.048).

• Spatial cues resulted in the significantly quickest RT and the absence of a cue produced the longest RT.

• The congruency of the flanker arrows had a significant main effect on the mean RT (p<0.001).

• Incongruent flanker arrows produced significantly longer RTs in comparison to neutral or congruent flanker arrows (p<0.001).

• Age had a significant main effect on RT (p<0.003).

• Type 2 Diabetes Mellitus did not produce a significant effect on the overall mean RT (p=0.568).

• T2DM and age did not produce significant effects on the three networks of attention.

• No two-way or three-way interaction effects on RT were seen between age, diabetes, congruency or cue type.

ATTENTIONAL NETWORK EFFECTS

Table 1: The mean attentional network effects, which are calculated using specific RT differences that are highlighted in the Attention Network Test box.

<table>
<thead>
<tr>
<th>Network of Attention</th>
<th>Difference in RT (ms)</th>
<th>T2DM group</th>
<th>Control group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alerting</td>
<td>9</td>
<td>500</td>
<td>500</td>
</tr>
<tr>
<td>Orienting</td>
<td>13</td>
<td>500</td>
<td>500</td>
</tr>
<tr>
<td>Executive control</td>
<td>129</td>
<td>500</td>
<td>500</td>
</tr>
</tbody>
</table>

DISCUSSION

• The significant effects of cue and congruency provide strong evidence to support the robustness of conducting the ANT through a remote platform.

• Contrary to the hypothesis, the overall RT for those who had a self-reported T2DM diagnosis was not significantly different from the control group.

• The executive control network of attention had the largest effect due to the greatest RT difference between trials containing incongruent flanker arrows and congruent flankers.

• As this study was non-clinical, future research could focus on the impact of T2DM within a patient cohort. Specifically, does the severity of diabetes influence attention?

References


