Beliefs about medicines predict reported side effects to antihypertensives: Secondary analysis of the TASMINH2 cohort

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Adverse effects as an attribution problem

This is Bob

On Monday, Bob takes his calcium channel blockers

On Tuesday, Bob has stomach cramps...
Adverse effects as an attribution problem

At least 3 explanations:

- Adverse effect?
- Another illness?
- Health functioning e.g. due to food?

Bob’s stomach ache
## Side effects to placebo (nocebo effects)

<table>
<thead>
<tr>
<th>Condition</th>
<th>General Population</th>
<th>Placebo arms of AD drug trials</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nausea?</td>
<td>11.9%</td>
<td>1.9-7.9%</td>
</tr>
<tr>
<td>Fatigue?</td>
<td>17.7%</td>
<td>1.9-3.4%</td>
</tr>
<tr>
<td>Headaches?</td>
<td>39.5%</td>
<td>3.9-47%</td>
</tr>
<tr>
<td>Abdominal pain?</td>
<td>20.3%</td>
<td>0.7-6.9%</td>
</tr>
<tr>
<td>Back pain?</td>
<td>51.7%</td>
<td>3.0-20%</td>
</tr>
</tbody>
</table>

The Necessity-Concerns Framework

Doubts about personal Necessity of medication

Nonadherence

CONCERNS About potential adverse effects

META-ANALYSIS
94 studies, 25072 patients, 20 countries, 18 LTCs (including hypertension)
Adherence Necessity \( OR = 1.742, p < 0.0001 \)
Concerns \( OR = 0.504, p < 0.0001 \)

\^Horne, Chapman, Parham, Freemantle & Cooper (2014) Understanding patients’ adherence-related beliefs about medicines prescribed for long-term conditions: a meta-analytic review of the Necessity-Concerns Framework. PLOS ONE
But do concerns predict reported AFs?

High blood pressure medication could be causing headaches and impotence

HIGH blood pressure is believed to affect one in four people in the UK - and is often treated using prescription medication.

By OLIVIA LERCHE
PUBLISHED: 14:26, Tue, Jul 25, 2017 | UPDATED: 16:37, Tue, Jul 25, 2017

HIGH blood pressure is a common condition affects thousands of people in the UK - with many working to lower their reading to reduce the risk of heart attack.

By OLIVIA LERCHE

Blood pressure: Intensive lowering could be linked to kidney disease

However experts have revealed if people lower their blood pressure reading too intensively it could increase the risk of developing another condition.
Questions

Are patients who have concerns about antihypertensives at baseline more likely to report side effects?
TASMINH2 Participants

From 24 GP practices in the West Midlands.

Main inclusion criteria

Aged 35-85

Receiving treatment for hypertension with antihypertensive medications

<table>
<thead>
<tr>
<th>Gender</th>
<th>n(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>225 (46.9%)</td>
</tr>
<tr>
<td>Female</td>
<td>255 (53.1%)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ethnicity</th>
<th>n(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>White</td>
<td>458 (95.4%)</td>
</tr>
<tr>
<td>Non-white</td>
<td>18 (3.8%)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Marital status</th>
<th>n(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Married</td>
<td>359 (74.8%)</td>
</tr>
<tr>
<td>Other</td>
<td>118 (24.7%)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Age</th>
<th>m(sd)</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>66.36 (8.79)</td>
</tr>
</tbody>
</table>
Measures

Baseline
- BMQ concerns
- Reported AEs

6 months
- BMQ concerns
- Reported AEs

12 months
- BMQ concerns
- Reported AEs

Reported AEs assessed via a symptom have you recently experienced 24 symptoms & is the symptom related to antihypertensives yes/no/don’t know
Rates of AEs constant

Concerns also constant
mean = 3.6
at each time point
### Baseline concerns and side effects?

<table>
<thead>
<tr>
<th></th>
<th>OR [95% CI]</th>
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</thead>
<tbody>
<tr>
<td><strong>Baseline</strong></td>
<td></td>
</tr>
<tr>
<td>‘possible’</td>
<td>1.76 [1.36-2.28]***</td>
</tr>
<tr>
<td>‘definite’</td>
<td>1.44 [1.09-1.91]**</td>
</tr>
<tr>
<td><strong>6 months</strong></td>
<td></td>
</tr>
<tr>
<td>‘possible’</td>
<td>1.72 [1.33-2.22]***</td>
</tr>
<tr>
<td>‘definite’</td>
<td>1.16 [0.89-1.52]</td>
</tr>
<tr>
<td><strong>12 months</strong></td>
<td></td>
</tr>
<tr>
<td>‘possible’</td>
<td>1.31 [1.03, 1.68]*</td>
</tr>
<tr>
<td>‘definite’</td>
<td>1.10 [0.84, 1.44]</td>
</tr>
</tbody>
</table>
What else predicts SEs (univariate)?

- Age & gender
- Taking more antihypertensive medicines
- Intensity of antihypertensive treatment (DDD)
- Taking more other medications
- Receiving the self monitoring intervention
- Duration of hypertension
- Blood pressure (systolic/diastolic)
- Necessity beliefs
- Adherence
Multivariate model (GEE)

Concerns

Definite: $B = 0.61 \ [0.43, 0.80]^{***}$
Possible: $B = 0.30 \ [0.10, 0.50]^{**}$

Number of anti hypertensives
Possible: $0.23 \ [0.03, 0.43]^{**}$

BUT, baseline reported SEs not included in model
Overall

Concerns seem to be a relatively strong predictor of adverse effects

BUT, what comes first, AEs or concerns?
Caveats

1. Reported adverse effects measure dependent on recall
2. Trial may have included more adherent/motivated patients
3. Patients all taking medication already at start of trial so can’t infer causality

But, raises the possibility of interventions to reduce concerns and reduce AEs
Thanks to:

Co-authors: Richard McManus, Emma Bray, Richard Hobbs, Paul Little, Bryan Williams, Sheila Greenfield, Jonathan Mant, Rob Horne

And participants!
Any questions?