Down syndrome:
Systematic review of the prevalence and nature of presentation of unipolar depression

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Case

• AB, male in mid-late 30’s with DS (severe ID).
  – Lived all his life with his parents.
  – No previous contact with MH services
  – Father passed away, G stays with mother, seemingly settled
  – Some months later:
    • change in behaviour at work and at home: destructive, distressed: crying day and night, oversensitive to small changes in daily routine.
    • GP review: some issues with physical health
    • Continued problems, mother elderly and having difficulty in coping
    • Moved to supported accommodation – further worsening presentation
    • Finally…. referral to MH services: at this point requiring inpatient care.

• Timely recognition of a MH problem?
  – Easier to spot on a timeline (!)
Depression

• Most common MH problem diagnosed in community samples
  – Morbidity

• Diagnosis not always straightforward
  – General population
  – ID population
    • Communication of innermost thoughts and feelings
    • Diagnostic overshadowing
    • The consequence of impaired detection?

DS and depression

• DS most common chromosomal abnormality leading to ID

• Research has highlighted
  – suggested vulnerability to depression
  – possible link between signs and symptoms of depression and the development Alzheimer’s disease (‘prodrome’)


AIM

- Assess for the PREVALENCE and NATURE of presentation of unipolar depression in DS.
  - Systematic review
Methods

• PRISMA (2009) checklist followed where possible
Eligibility criteria

• Participants
  – Individuals with DS
  – No limitations for age or gender

• Intervention
  – Primary research investigating the prevalence and nature of presentation of symptoms of depression in DS.
  – Exclude challenging behaviour
  – Exclude studies pertaining to AD.
  – Exclude bipolar affective disorder.
  – Exclude studies pre-dating 1990
  – Exclude studies not in the English language
• **Comparison**
  – The aim is to complete a systematic review analysis of the studies found.

• **Outcome**
  – Data for the prevalence of unipolar depression in DS and the nature of its presentation.

• **Study design**
  – Primary research excluding individual case studies.
Information sources

- Cardiff University’s Electronic Portal of databases
  - Medline
  - Embase
  - PsychInfo
  - Web of Science
  - CINAHL.
- English language, peer reviewed journals
- Published between 1st January 1990 and 30th September 2013
- Relevant journals, review articles and bibliographies hand searched
Search strategy

- Terms kept broad:

- Down Syndrome combined with:
  - Psychopathology
  - Depression
  - Mood disorder
  - Or Affective disorder
### Summary methods

<table>
<thead>
<tr>
<th>Item</th>
<th>Criteria</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of participants</td>
<td>&gt;100</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>&gt;30-100</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>&lt;30</td>
<td>0</td>
</tr>
<tr>
<td>Characteristics of participants</td>
<td>Group representing target population of the instrument (screening for depression)</td>
<td>0/1</td>
</tr>
<tr>
<td>Psychopathology of the participants</td>
<td>&gt;20-50% of participants had depression</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>10-20% or &gt;50-90% had depression</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>&lt;10% or &gt;90% of the participants had depression</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Unclear</td>
<td>0</td>
</tr>
<tr>
<td>Gold standard</td>
<td>Clinical diagnosis by a psychiatrist or psychologist based on standard diagnostic system</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Clinical diagnosis by a psychiatrist or psychologist</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Other depression screening instrument used as reference standard</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>All other</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Not applicable</td>
<td>0</td>
</tr>
<tr>
<td>Report on measures of validity</td>
<td>Standard deviation or standard error, or confidence interval is reported.</td>
<td>0/1</td>
</tr>
</tbody>
</table>

Results of search strategy as per PRISMA Guidance (Moher, 2009)

- 634 records identified through database searches
- 2 records identified through hand searching review articles
  - 636 records screened
  - 19 abstracts screened for eligibility
    - 9 excluded
    - 10 full text articles screened for eligibility
      - 2 excluded
      - 8 studies included in qualitative synthesis
<table>
<thead>
<tr>
<th>Study Design</th>
<th>Characteristics</th>
<th>Quality score</th>
<th>Frequency of depression in sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collacott et al (1992)</td>
<td>Cross-sectional study</td>
<td>371</td>
<td>DS Community sample</td>
</tr>
<tr>
<td>Cooper &amp; Collacott (1994)</td>
<td>Cross-sectional study</td>
<td>378</td>
<td>DS Community sample</td>
</tr>
<tr>
<td>Capone et al (2011)</td>
<td>Cross-sectional study</td>
<td>56</td>
<td>DS Patients presenting to a university-level medical clinic</td>
</tr>
<tr>
<td>Myers &amp; Pueschel (1991)</td>
<td>Cross-sectional study</td>
<td>497</td>
<td>DS 425 university clinic &amp; 72 residential care</td>
</tr>
<tr>
<td>Myers &amp; Pueschel (1995)</td>
<td>Cross-sectional study</td>
<td>164</td>
<td>DS Regular attendees to a university-affiliated DS clinic</td>
</tr>
<tr>
<td>Mantry et al (2008)</td>
<td>Cohort</td>
<td>T1 186 T2 134</td>
<td>DS Community sample</td>
</tr>
<tr>
<td>Prasher (1995)</td>
<td>Cross-sectional study</td>
<td>201</td>
<td>DS (age 16 or above) Community sample</td>
</tr>
<tr>
<td>McCarthy &amp; Boyd (2001)</td>
<td>Cohort</td>
<td>T1 193 T2 52</td>
<td>DS register – community sample</td>
</tr>
</tbody>
</table>

Prevalence and incidence of depression in DS

• Patterns did emerge
  – Despite difference in populations sampled and study designs

• Depression is the most common psychiatric condition
  – Exclude dementia

• Studies that investigated both mental ill health and depression suggested that:
  – Depression is more common in DS in comparison to general ID population
  – Mental ill health (all causes) less common in DS population in comparison to general ID population
Prevalence and incidence of depression in DS

• Depression frequency
  – 5-13% (university / healthcare samples)
    » Exclude children
  – 2.7- 13% (community sample)

• Age groups

• Level of ID
<table>
<thead>
<tr>
<th>Study</th>
<th>Frequency of depression</th>
<th>Source of subjects</th>
<th>Age</th>
<th>Level of ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collacott et al (1992)</td>
<td>11.3%</td>
<td>Health service &amp; community records</td>
<td>16-78 years</td>
<td>Not differentiated</td>
</tr>
<tr>
<td>Cooper &amp; Collacott (1994)</td>
<td>11.1%</td>
<td>Health service and community records</td>
<td>11-50 years</td>
<td>Not differentiated</td>
</tr>
<tr>
<td>Capone et al (2011)</td>
<td>11/117 (9.4%) MDE*</td>
<td>University based clinic for DS</td>
<td>13-35 years</td>
<td>Not differentiated</td>
</tr>
<tr>
<td></td>
<td>9/117 (7.7%) MDE*</td>
<td>'deficit syndrome'</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>8/117 (6.8%)</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Myers &amp; Pueschel (1991)</td>
<td>10/497 (2%)</td>
<td>University clinic for DS, and a local state school</td>
<td>-261 subjects &lt;20 years</td>
<td>Not differentiated</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>-164 subjects &gt;20 years</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>-72 subjects between 29-72 years</td>
<td></td>
</tr>
<tr>
<td>Myers &amp; Pueschel (1995)</td>
<td>9/164 (5.5%)</td>
<td>University affiliated outpatient clinic</td>
<td>21 – 44 years</td>
<td>6 of 9 moderate ID</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2 severe ID</td>
</tr>
<tr>
<td>Mantry et al (2008)</td>
<td>T1 5/166 (2.7%)</td>
<td>Community sample</td>
<td>16-74 years</td>
<td>41.1% mild ID, 26.9% moderate ID, 18.3% severe, 13.4% profound ID</td>
</tr>
<tr>
<td></td>
<td>T2 7/134 (5.2%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prasher (1995)</td>
<td>10/215 (5%)</td>
<td>Hospital and community samples</td>
<td>16-76 years</td>
<td>21% mild ID, 66.7% moderate ID 13.4% severe ID.</td>
</tr>
<tr>
<td>McCarthy &amp; Boyd (2001)</td>
<td>7/52 (13%) adult sample</td>
<td>Community</td>
<td>Child 6-17 years</td>
<td>Not differentiated</td>
</tr>
<tr>
<td></td>
<td>1/193 (0.5%) child sample</td>
<td></td>
<td>Adult 22-33 years</td>
<td></td>
</tr>
</tbody>
</table>
Presentation of depression

- Symptoms highlighted did not fit neatly into different categories (i.e. biological, objective)
  - Most common: reduced interest/pleasure (91%), depressed affect (88%), psychomotor retardation (59%), loss of energy (57%), and appetite/weight disturbance (55%).
  - Least common: constipation (13%), obsessions/compulsions (13%) and mood congruent delusions or hallucinations (5%).

» Cooper & Collacott (1994), n=378
Presentation of depression

• Certain more common symptoms:
  – Observed ‘vegetative’ as opposed to verbal / symptoms of self-expression
  – 4 of the 9 subjects reported hallucinations
    » Myers & Pueschel (1995) n=9

• Major Depressive Episode symptoms described included:
  – Anhedonia and depressed mood, plus, biological symptoms such as disturbed sleep, reduced attention and psychomotor slowing.
  – ‘deficit syndrome’ → possible atypical depression or psychosis

• Within same study a group diagnosed with MDE with psychotic features
  – Met criteria for both MDE and schizophreniform disorder
  – 7.7% of the study population
  – No details of the symptoms of psychosis were available.
    » Capone et al (2011) n=56
Methodological concerns & bias

• 6/8 cross-sectional studies:
  – Concerns regarding methodology (or lack of clarity) mean that conclusions not drawn with confidence
  – Unclear from the methods whether data relates to ‘life-to-date’ prevalence or point/period prevalence

• 7/8 retrospective case note analyses
  – Observer bias

• Low participant numbers in some studies
  – Impossible to stratify with any accuracy for age or level of ID
Conclusions

• Does this study alter the ‘stereotypical’ phenotype?
  – DS prone to depressive episodes
  – Perhaps more so than general ID population
  – (also evidence to contrary – Lund, 1988)

• Course of depression in DS
  – Suggestion of shorter episodes
    » Cooper & Collacott, 1994
  – One study showed 2-year incidence higher than point prevalence – would support this
    » Mantry et al, 2008

• Increased frequency of depression in adult samples in comparison to children
  » McCarthy & Boyd (2001), Myers & Pueschel (1991)
• Difficult to form firm conclusions regarding ‘nature’ of depressive illness from current evidence
  – Biological symptoms
  – Psychosis
  – Deficit syndrome and possible links to dementia or simple schizophrenia

• Which diagnostic tools do we use?
Clinical practice

• Review has demonstrated need for high index of suspicion when assessing individual with DS
  – Depression relatively high frequency event
  – Has varied presentation
  – Requires education of carers, allied health professionals and teachers for recognition

• Allow for timely diagnosis and management, therefore reduced distress for all concerned
Future directions

• Large-scale cohort studies may give more indication of the nature and course of depression in DS

• Clearer methodology of cross-sectional studies will give more meaningful results
Limitations of this review

• Limitations related to search criteria:
  – Excluded challenging behaviour
  – Excluded Alzheimer's dementia
  – Both important in terms of the characterisation of the nature and symptoms of depression in DS

• Limitations of systematic review:
  – Unable to perform further statistical analysis due to the heterogeneous aims and objectives of each of the studies. Also due to the lack of clarity regarding the frequencies quoted in some studies.
Thanks for listening!

• Any questions?
Main references


Please get in touch for full list of references