Mental Ill-Health & Challenging Behaviour in PWID & Epilepsy

S Arshad
Objectives

- Epidemiology
- Mental Health problems / Behavioural Impairment – any commoner in PWID & Epilepsy
- Factors Influencing
- Management Challenges
- Types of Behavioural Impairment – aggression / stereotyped behaviour / role of AEDs
- Mental Ill-Health – Psychosis
- Principles of Assessment & Management
- Case examples
- Role of Drug Interactions
- Take Home Messages
Epidemiology

- Prevalence of epilepsy in PWID – reported well in excess of that in general population
- 22% - pooled estimate from recent meta-analysis of studies published since 1990 \(^1\) (compared with 0.08% in general population) \(^2\)
Epidemiology

• But why? – several hypothesis, for example:
  – Shared aetiology: both ID & Epilepsy are result of brain damage / permanent dysfunction – genetic causes
  – One leading to other: Epilepsy causing permanent brain damage leading to ID, continuous epileptiform discharges leading to ID without obvious brain damage etc.
  – Some seizure types are associated with neuronal damage
  – Peri-Ictal Phenomenon: successive seizures leading to little or no recovery time, misinterpreted as ID
  – Use of ADEs: AEDs can impair cognitive functioning but extent / severity is unknown.
Is Mental Ill-Health More Common in PWID & Epilepsy?

• Earlier studies: Depression, psychosis, personality change, Schizophrenia Spectrum Disorders ... But ...
• Selection bias, use of instruments like Present state Examination / MMPI etc.
• Recent studies: no significant difference. 3, 4, 5
• Use of more appropriate instruments like PAS-ADD, effect of AEDs on psychiatric symptomatology, selection bias etc.
• Presence of epilepsy alone was not a clear determinant of neuropsychiatric comorbidity, although identified a tendency towards negative mood symptoms. 5
Are Behavioural Impairments more Common in PWID & Epilepsy?

- A number of factors have been linked to increased rates of behavioural impairment in PWID and Epilepsy in several studies. ⁶, ⁷
- These include: treatment resistance, high frequency of seizures, polypharmacy, simply an effect of AEDS, immune-mediated epilepsies (auto-immune encephalopathies), misinterpretation of seizure-related activity as behavioural impairment (automatism, stereotyped behaviours), sleep dysregulation etc.
Behavioural Impairment in PWID & Epilepsy

- Commonly seen behavioural impairments are:
  - Aggression (verbal / physical / both)
  - Self – injurious tendencies
  - Stereotyped behaviours
  - AED – related behavioural impairment

- Prevalence of aggression in epilepsy varies between 4.8% & 50%. One study reported prevalence of 27%. Real prevalence remains controversial.
Factors Influencing CB in PWID & Epilepsy on AEDs

- Severity of seizures.
- Poorly controlled / inadequately treated seizures
- Poor compliance with treatment plan (inc. exposure to triggers)
- High doses of AEDs (drugs potentiating / antagonising effects of each other)
- Polytherapy
- Rapid titration
- Familial Hx of mental ill-health
- Past Hx of psychiatric morbidity
Management Challenges

- Genetic conditions
- Behavioural Phenotype
- Environmental Factors
- Communication difficulties
- Informant bias
- Poorly understood aetiology
- Yield of investigations
- Medication (AEDs & Psychotropic Drugs)
Aggression in Epilepsy

• Violence Vs. Aggression
• Violence: forceful infliction of abuse or damage directed towards other individuals or objects.
• Aggression: offensive action directed towards other individuals or objects with intent to harm, threaten or control.
• “assessment of intentionality”
• Ictal Aggression: rare, patient usually amnestic, directed towards nearby individuals / objects
• Post-Ictal Aggression, commoner but still rare, occurs following clusters of seizures, usually co-occurs with post-ictal confusional states or psychosis, patients are aroused, angry or fearful, actions are restrictive and poorly structured.
Aggression in Epilepsy

- **Inter-Ictal Aggression**: seen in PWID but rare otherwise, may co-exist with anti-social personality disorder, often referred to as ‘episodic dys-control’ – characterised by several discrete episodes of extreme unprovoked arousal. Could this be a result of poor appreciation of social norms or communication incompetence to express needs in PWID?

- Aggression is a common manifestation of psychosis, less commonly seen in bipolar affective disorder, depression, anxiety or phobia. It can also occur in substance abuse – both acute intoxication as well as deprivation.
**Aggression in Epilepsy**

Functional Relevance of Location and Aggressive Behaviour

<table>
<thead>
<tr>
<th>Brain Structure / Foci</th>
<th>Assumed Function</th>
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<tbody>
<tr>
<td>Frontal Lobe</td>
<td>Inhibitory function, suppression of aggressive behaviour drive</td>
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<tr>
<td>Amygdala &amp; Limbic Circuits</td>
<td>Emotional drive and arousal</td>
</tr>
<tr>
<td>Hypothalamus</td>
<td>Regulation of internal environment (e.g. endocrinological / immunological regulation), coordination of behaviour in flight-fight situation</td>
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<tr>
<td>Brain Stem Structures</td>
<td>Activation of behaviours in flight-fight situation e.g. attack / defence</td>
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Stereotyped Behaviours

• Stereotyped behaviours are core feature of certain conditions like Angleman syndrome, Rett Syndrome.
• Also commonly seen in Autism Spectrum complex.
• Characterised by purposeless, repetitive movements of axial body parts or extremities.
• Commonly seen in PWID & Epilepsy – due to shared aetiology possibly.
• Could it be manifestation of self-induced stimulation to compensate sensory deprivation? Or poor opportunities of adequate sensory stimulation from environment? ⁹
• Is it an isolated movement disorder resulting from dysfunction of dopaminergic pathway in basal ganglia? ¹⁰
• Or is it a dysfunction of executive control mechanism in frontal lobes? ¹¹
Anti-Epileptic Drugs

• AEDs may have positive or negative impact on behaviour
• May introduce or worsen hyperactivity, irritability, aggression, emotional lability etc.
• “Forced Normalisation” – a phenomenon characterized by entirely or near normalisation of previously (or subsequently) abnormal EEG in epilepsy subjects with occurrence of psychotic states.
• Those suffering from disabling epilepsy, if suddenly become seizure free without being sedated, may display tendencies of behavioural impairment. ¹²
• This can occur with several AEDs but especially common with ones that have low sedative properties e.g. lamotrigine.
## Psychotropic Effects of Anti-Epileptic Drugs

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<tr>
<th>Drugs</th>
<th>Positive Psychotropic Effects</th>
<th>Negative Psychotropic Effects</th>
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<tr>
<td>Barbiturates</td>
<td>-</td>
<td>Aggression, Depression, withdrawal, ADHD like Sx in Children</td>
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<tr>
<td>Benzodiazepines</td>
<td>Anxiolytic, sedative</td>
<td>Withdrawal, rebound aggression in PWID</td>
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<tr>
<td>Ethosuximide</td>
<td>-</td>
<td>Insomnia, psychosis, irritability</td>
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<td>Phenytoin</td>
<td>-</td>
<td>Psychosis, encephalopathy, slowness</td>
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<tr>
<td>Carbamazepine</td>
<td>Mood stabilisation, impulse control</td>
<td>Rarely mania, slowness</td>
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<tr>
<td>Valproate</td>
<td>Mood stabilisation</td>
<td>Encephalopathy, slowness, extrapyramidal effects</td>
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<td>Lamotrigine</td>
<td>Mood stabilisation, antidepressant</td>
<td>Insomnia, psychosis (rarely)</td>
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<td>Gabapentine</td>
<td>Anxiolytic</td>
<td>Sedation, Aggression in children (rarely)</td>
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<td>Topiramate</td>
<td>Mood stabilisation</td>
<td>Depression, psychosis, irritability</td>
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<tr>
<td>Levetiracetam</td>
<td>-</td>
<td>Depression, irritability, CB in PWID</td>
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Mental ill-Health in PWID & Epilepsy

• Epilepsy does not increase the likelihood of psychopathology in ID but affective disorders are commonly over represented in PWID and Epilepsy.
• Theoretically, co-existence can result in diagnostic overshadowing
• May result in poor compliance with management plan
• Risk of polypharmacy
Psychosis in PWID & Epilepsy

- Risk factors for development of ictal psychosis: lower age of onset, temporal lobe involvement, poor intellectual functioning. ⁸
- Postictal psychosis is usually self-limiting
- Management of postictal psychosis can be directed at two different stages:
  - (Favoured?) Use of sedatives in initial hypomanic phase (arousal state) to prevent development of frank psychosis.
  - Immediately upon onset on psychosis to reduce its duration (Dopamine blockers on their own or in combination with Benzodiazepines)
Assessment of Mental Health Problem & Challenging Behaviour in PWID & Epilepsy
Assessment in PWID & Epilepsy

• Assessment of behavioural impairment must have multi-professional / disciplinary approach

• It often helps to include structural assessment tools like PAS-ADD / Aberrant Behaviour Checklist. Plus functional analysis of behaviour.

• Aetiology of ID itself and / or epilepsy should be taken into consideration

• Presence of other psychopathology (inc. PDD) should be taken into account

• Monitoring behaviour peri / post ictal can help establish baseline impairment and deterioration

• Association between behavioural worsening / improvement and epilepsy control should be established.
Management of Mental Health Problem & Challenging Behaviour in PWID & Epilepsy
Psychosis in PWID & Epilepsy

- Principles of management:
  - Recognise early
  - Treat early
  - If possible, prevent development of frank psychosis
  - Improved overall seizure control can prevent its development
  - Efforts to reduce generalised seizures and complex partial can prevent recurrence of postictal psychosis
Affective Disorders in PWID & Epilepsy

• Principles of management:
  – Consider non-pharmacological interventions either on their own or in conjunction
  – Use structured tools for monitoring (e.g. HoNOS)
  – Improved overall seizure control can prevent low mood
  – Most AEDs have mood stabilising effect – use to patients’ advantage!
  – Be mindful of worsening affective symptomatology with environmental or endogenous factors
Behavioural Impairment in PWID & Epilepsy

• Principles of management:
  – Behavioural impairment could be multi-factorial hence a thorough assessment before initiating medication is needed.
  – Advantage of joined up psychiatry / neurology services, benefits of dedicated Specialist Behaviour Management Teams
  – Where psychototropic medication is used, it is best to establish its efficacy, safety and objectives of use. Monitor closely
  – Be mindful – some psychototropic drugs can influence behaviours negatively.
Use of Psychotropic Medication for Aggression

Recommendations:

- Consider psychotropic drugs when psychological and / or interventions alone are unable to bring desired results
- Where possible, use psychotropic medication in combination with other interventions (PBS / Psychological interventions etc.)
- Except for acute aggressive emergency intervention, antipsychotic drugs may be more harmful
- Where necessary, atypical antipsychotics are preferred over traditional due to low toxicity profile for long term use
- Clozapine is best avoided due to its potentially pro-convulsive nature and unpredictable interactions with AEDs
- Data on efficacy and safety on use of MPH in PWID & Epilepsy is lacking
Epilepsy Surgery

- ID is not a contraindication to Epilepsy Surgery
- Dependent upon several factors inc. location, aetiology etc., full or partial remission with surgery is possible.
- Epilepsy surgery may provide positive outcome for cognitive and behavioural impairment in some individuals.
- Despite significant advances, it is not always possible to predict outcome of surgical intervention of overall seizure control and/or behavioural presentation.
- Some studies have reported no drop in cognitive abilities amongst PWID; others (smaller sample) have reported an overall improvement or prevention of progressive decline in conditions like TSC.
Case Example - I

- 63yo man, resident of 24hrs group staffed home
- Twin sister – lives around SW coast
- Mild LD w past Hx of CB, Paranoid Schizophrenia (last relapse in 2012-13), Generalised epilepsy (seizure free since 2008)
- Current Rx: Carbamezapine, Olanzapine, Thyroxine, Vit D supplement, prn PCM.
- Known to LD Psychiatry – no other specialist service
- Not keen on doctors! Hadn’t had a health review but sister persuaded him
- Presented to A&E Department locally with H/O fall and investigated to have sustained fracture neck of femur
Case Example - I

• Second fall in course of a week – luckily escaped any serious injury after first one
• Been to see GP last month, CBZ reduced
• ~3 wk H/O tiredness, drowsiness, not wanting to engage, remains in bed
• Hospital admission for # neck of femur, required surgical intervention, remained in hospital for 16 days
• Discharged with ongoing community physiotherapy intervention, mobility and independence seriously compromised.
• What could have resulted in fall?
Case Example - II

- 21 yo female
- Moderate ID, Childhood Autism, significant communication problems, visual impairment
- H/O febrile convulsions aged 20mths – did not require treatment
- Aged 19 yr developed affective psychopathology following bereavement, as treated with SSRI
- SSRI discontinued and developed signs of relapse (refusing to eat / tearfulness / EMW with disturbance of behaviour)
- Lives with parents and younger adopted sibling
- Developed RTI, prescribed antibiotics and presented to local A&E with 2 episodes of seizure-like activity – 1 hour apart
• S/B neurologist on day 2 of admission, investigations and stabilised on Carbamazepine
• Presented to A&E again a fortnight later with worsening drowsiness, new onset slurring of speech and ataxia
• Admitted to MAU and 12 hours later displayed significant CB (acc. to family is extremely unlike her) and visual hallucinations
• What may have caused / contributed towards sudden deterioration?
Case Example - III

• 28yo man with moderate LD, viral encephalitis in infancy, childhood history of RTA resulting in penetrating injury and subsequently developed generalised epilepsy and right hemiparesis.

• Family Hx: Mother diagnosed with severe depression with psychotic Sx – known to CMHT, required multiple admissions.

• Lived OOH. Aged 21y presented with erratic sleep pattern, poor concentration, elation of mood that soon developed into hypomania. Aged 22y, diagnosed with Bipolar Affective Disorder and treated with Lithium.

• Aged 26y, moved back closer to extended family. ? Negative influence
Case Example - III

• Started consuming alcohol – binge pattern – Friday night onwards and often led to medication non-compliance & break-through seizures.
• AEDs included Levetiracetam and Clobazam
• Discovered by public on late Sunday afternoon, suspected to have lost consciousness following status epilepticus, taken to A&E via ambulance.
• Treated with diazepam upon arrival and later with IV Fosphenytoin. Discharged later with 14d supply of phenytoin.
• Presented to A&E 5d later with repeated vomiting, slurring and dizziness – suspected alcohol intoxication
Case Example - III

- Later developed tremors and ataxia with C/O severe abdominal pain
- O/E was found to have Hyperreflexia
- What could havepossibly caused current presentation?
Carbamazepine accelerates metabolism of Olanzapine
Case Example - II

Fluoxetine increases Carbamazepine level in blood
Phenytoin causes Lithium toxicity
Management of Mental Health Problem & Challenging Behaviour in PWID & Epilepsy

Drug Interactions
Literature Review

- Paucity of research base in this field
- Most studies are dated 1990s and early 2000
- Majority of studies are conducted on non-LD population
- Searched key words such as antiepileptic, antipsychotic, antidepressant, mood stabiliser, psychotropic, interaction.
- PubMed search initially generated over 200 articles –
- Most of the studies focus on single psychotropic / AED, very few looked at class effects – understandable – as effects vary significantly within a class for psychotropic drug, not as much for AEDs
- Summary of review articles

- Potential for drug-drug interaction is very high and often neglected
- Recognises use of AP use outside psychosis for M/M of CB
- Also recognises use of AEDs outside AE effect
- Provides a handy (but limited use) chart of interactions using 6 AEDs and commonly used Aps
- Concludes that multiple factors are important in DIs inc. age, gender, ethnicity etc.
- Recommends *in vitro* studies for newer AEDs
- Recommends *in vivo* studies for better understanding of clinical significance of DIs
Clinical Significance of Pharmacokinetic Interactions Between Antiepileptic and Psychotropic Drugs

• Recognises increasing trend for drug use in combination
• Most DIs take place at metabolic level – inv. Hepatic enzymes
• Details class effect (antidepressant / antipsychotic / anxiolytic / Lithium) but understandably doesn’t go into details of individual drugs with unusual MoA within each class (e.g. Mirtazapine / Venlafaxine)
• Recommends careful clinical observations and in considered cases perhaps drug level monitoring to adjust individual drug doses.
Antiepileptic Drug Interactions in Patients Requiring Psychiatric Drug Treatment

- Recognises wide-spread use
- Discusses sections of DI in antidepressants, antipsychotic and Lithium.
- Provides comprehensive explanation for DI reasons (enz. Ind etc)
- Recommends dosage adjustment in individual cases
- Recommends antipsychotic dose adjustment when used together with enz. Inducing AEDs.
Interactions Between Antiepileptics and Second Generation Antipsychotics

- Most comprehensive review of AED interaction with details on bioavailability, half-life, plasma conc. Etc. after administration of individual antipsychotics.
- But doesn’t expand into other psychotropic
- Looks both at pharmacokinetic & pharmacodynamics DIs
- Acknowledges limitations of available data
- Concludes that commonest interactions are weight gain and excessive sedation (leading to other complications) with rare significant untoward and / or life threatening events
- Recommends further clinical studies (not pharmaceutical RCTs) reporting S/Es with combined use
• Another lengthy and comprehensive review of AED interaction with details on bioavailability, half-life, plasma conc. Etc. after administration of individual antipsychotics.
• Includes less commonly used AEDs and only review to include Clozapine. Does not include other psychototropic drugs
• Recommends clinicians’ understanding of DI to minimise influences on drug efficacy and toxicity
• Recommends further large group studies to confer adequate statistical power perhaps that look into elimination rates of one drug group before and after the other.
Establishing Baseline Practices

• All SUs who attend community based services with diagnosis of Intellectual Disabilities, epilepsy with or without diagnosed mental ill-health but concomitantly prescribed antiepileptic drugs and psychotropic medication.
• Collected demographic data on anonymised electronic data collected sheets
• Reviewed clinical correspondence from preceding 12 months to establish whether interactions between psychototropic medication and antiepileptic drugs was discussed and recorded.
Results

• 57.6% were men with ID & Epilepsy.
• 69.2% had no other physical health problem.
• The commonest presentation was behavioral impairment (88.46%) and 69.2% had no concurrent neurodevelopmental condition.
• 71.1% had no additional psychopathology diagnosed; for the reminder, anxiety was the commonest diagnosis (11.5%) followed by mood (9.6%) and psychotic disorders (7.9%).
• Antipsychotics were the commonest (86.5%) psychotropic drugs used, followed by antidepressants (34.6%).
• Valproate is the commonest (46.2%) AED used followed by Carbamazepine (42.3%).
Results

- Monitoring of compliance was recorded in 57.7% of cases
- Consent to treatment in 32.7% and
- Side effect monitoring was recorded in 34.6% cases.
- Drug interactions recorded in none of the cases.
- Data for individual AEDs and psychotropic drug combinations was analysed to find 63.5% cases had serious or significant potential drug interaction, 21.2% had none. In 15.4% cases, the interactions were either not known or not established in scientific literature
Association Between Age Range and Risk of DI

With increase in age, the odds for risk of drug interaction (versus no interaction) increase by a factor of 1.11 (95% CI: 0.71- 1.7).

Association Between Physical Co-Morbidity and Risk of DI

In presence of other health problems, the odds of developing DI increase by 1.2 times (95% CI 0.28 – 5.45).
Association Between ASCs with Mental Ill Health and Risk of DI

Psychiatric illness combined with neurodevelopmental disorder in PWID & epilepsy potentially increases the risk of developing drug interactions by a factor of 4.07 (95% CI 1.30-12.7)

Association Between Level of ID and Risk of DI

Our results show that severe ID has 1.2 times and moderate ID has 2.4 times lower risk of potential DI. The highest odds of developing DI lie within mild ID.
Association Between Behavioural Impairment and Risk of DI

Behavioural impairment increases the risk of drug interactions. The odds for risk of DI increase by a factor of 0.46 (95% CI: 0.076-3.08)
Top 3 Offenders

Antiepileptic Drugs
- Carbamazepine (≈24%)
- Valproate (≈22%)
- Levetiracetam (≈16%)

Psychotropic Drugs
- Antipsychotic (≈56%)
## Summary of Psychotropic and Anti Epileptic Drug Interactions

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<th>CBZ</th>
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</table>

- ↑: Increased effect
- ↓: Decreased effect
- X: No interaction
- ↑↑: Strong increased effect
- X Sedation: Sedation effect
- TOXIC: Toxic interaction
**Summary of Psychotropic and Anti Epileptic Drug Interactions**

<table>
<thead>
<tr>
<th>Drug</th>
<th>CBZ</th>
<th>VPA</th>
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Take Home Message

• Management of CB and MHP in PWID & Epilepsy is a complex matter – requires specialist input.
• It is worth investing into resources like specialist behaviour assessment service, epilepsy nursing, joined up Neurology & ID Services.
• Psychotropic drugs are not the only solution – and should not be used in isolation.
• Be mindful of drug interactions, its recording and discussion is everyone’s business.
• Minimising drug interactions can result in improved compliance, better quality of life, lesser dependence, fewer longer term health consequences (e.g. obesity, falls etc) and perhaps fewer presentation to OOH services like A&E
Take Home Message

• To be mindful of drug interactions, its recording and discussion is everyone’s business.
• Where majority are limited to affecting quality of everyday life (excessive sedation and drowsiness), a few have potentially life threatening consequences
• Minimising drug interactions can result in improved compliance, better quality of life, lesser dependence, fewer longer term health consequences (e.g. obesity, falls etc)
• It may also result in fewer presentation to OOH services like A&E
References

Resources

- Oxford Specialist Handbooks in Neurology – Epilepsy
- Antiepileptic Drug Interactions by P N Patsalos
- Learning Disabilities and Epilepsy by M Trimble
- https://books.google.co.uk/books?hl=en&lr=&id=p39MJbd-4TMC&oi=fnd&pg=PA350&dq=Antiepileptic+Drug+Interactions+in+Patients+Requiring+Psychiatric+Drug+Treatment++trimble&ots=5VRVmt1PgX&sig=LHMSHhmkXaM9CBnsShx6P8jLNgU#v=onepage&q=Antiepileptic%20Drug%20Interactions%20in%20Patients%20Requiring%20Psychiatric%20Drug%20Treatment%20trimble&f=false
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