



Detecting hyperprolactinaemia in mental health patients

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ABSTRACT Shaw, M. (2005) Detecting hyperprolactinaemia in mental health patients. *Nursing Times*; 101: 49, 24-26.

Hyperprolactinaemia is associated with drugs used in mental health to treat psychosis (antipsychotics) and affects a significant number of service users. The condition causes endocrine disturbances, including sexual dysfunction, amenorrhoea and infertility. In the longer term, service users are also at risk of disabling conditions such as osteoporosis. Early detection of hyperprolactinaemia enables safer use of antipsychotic drugs. This article focuses on neuroendocrine adverse effects and how this problem can be addressed.

Antipsychotic drug use has been associated with impaired sexual functioning for almost 40 years (Shader and Grinspoon, 1967). A recent survey showed that at least one symptom of sexual dysfunction was reported by 82 per cent of men and 96 per cent of women who had a diagnosis of schizophrenia (MacDonald, 2003).

The role of prolactin

Prolactin is a glycoprotein, similar in structure to growth hormone. It is a milk-producing hormone and is made in the anterior lobe of the pituitary body. Its role is to stimulate the mammary gland and prepare the mother's body for lactation following childbirth.

During pregnancy, although the prolactin level rises, high levels of oestrogen and progesterone prevent

lactation. After childbirth the levels of oestrogen and progesterone decrease, triggering lactation. A raised prolactin level causes anovulation and amenorrhoea. Prolactin influences gonadal function in both sexes. However, normal prolactin levels are slightly higher in women than men.

Hyperprolactinaemia

The inhibitory control of dopamine is the most important mechanism in prolactin secretion. This neurotransmitter is secreted from the hypothalamus into the pituitary venous system where it binds to dopamine-2 (D₂) receptors on prolactin-secreting cells, thus inhibiting the secretion of prolactin.

Persistent hyperprolactinaemia is usually due to a micro-adenoma of the anterior pituitary. Dopamine receptor agonists including antipsychotic drugs can also be responsible (Walker and Renwick, 1994).

The therapeutic action of the D₂ receptor blockade is to reduce the positive symptoms of psychosis such as perceptual and thought disorders, including hallucinations and delusions. It has long been known that blocking this receptor with antipsychotic drugs prescribed to treat these symptoms will often cause extrapyramidal side-effects (EPSE) such as Parkinsonism, akathisia (motor restlessness), dystonia and tardive dyskinesia. Indeed the emphasis in pharmacological research in recent years, with the introduction of atypical (second-generation) antipsychotics, has been to eradicate EPSE. However, blockade at the D₂ receptor is also responsible for elevated prolactin levels causing endocrine problems including sexual dysfunction.

This mechanism has been recognised for more than 30 years (Beaumont, 1974) but until recently it attracted little clinical or scientific interest – despite the fact that it is common and distressing, and has the potential for long-term complications. Table 1 lists the physical effects associated with hyperprolactinaemia.

Research has consistently found that service users with psychosis (including schizophrenia) experience sexual dysfunction – 54 per cent of males with a diagnosis of schizophrenia who are taking antipsychotics experienced moderate to severe sexual dysfunction and 91 per cent of females reported menstrual changes (Ghadirian et al, 1982).

A great cause of concern is the link between hyperprolactinaemia and osteoporosis. Chronically low sex hormone blood levels result in increased resorption of bone calcium, reduced absorption of

Learning objectives



Each week *Nursing Times* publishes a guided learning article with reflection points to help you with your CPD. After reading the article you should be able to:

- Understand the role of antipsychotic medication;
- Explain the side-effects of antipsychotic medication, including hyperprolactinaemia;
- Know how to recognise and measure hyperprolactinaemia;
- Understand methods of managing hyperprolactinaemia.

TABLE 1. THE CLINICAL EFFECTS OF HYPERPROLACTINAEMIA

EFFECT	MALES	FEMALES
Anovulation		✓
Infertility		✓
Amenorrhoea		✓
Decreased libido	✓	✓
Gynaecomastia	✓	✓
Galactorrhoea	✓	✓
Erectile dysfunction	✓	
Ejaculatory dysfunction	✓	
Azoospermia	✓	
Weight gain	✓	✓

calcium from the gastrointestinal tract and increased loss of calcium from the kidneys. This reduces overall calcium content in bones, resulting in osteopenia or osteoporosis (Meaney and O'Keene, 2003).

Hyperprolactinaemia may also increase the risk of breast cancer and it has been suggested that women taking antipsychotic agents should undergo regular breast screening.

Many individuals suffering from psychotic disorders such as schizophrenia have several risk factors that can cause a predisposition to osteoporosis, including reduced vitamin D, cigarette smoking, excess alcohol and insufficient exercise (particularly weight-bearing exercise). Their attendant risk of medication-induced hyperprolactinaemia means their bone health is at risk of impairment.

Recognition and management

The community treatment team was commissioned in 1998 to work with service users on medication management. The team consists of five RMNs with a special interest in psychotropic treatment strategies. It runs community clinics and provides a domiciliary service for treatment and monitoring including depot, clozapine and mood-stabiliser clinics (Shaw, 2004). Side-effect monitoring and management is a priority with the aim of reducing adverse effects and enhancing outcomes by improving concordance.

Using validated systematic rating scales, such as the Liverpool University Neuroleptic Side Effect Rating Scale (LUNSERS) (Day, 1995), the team works closely with service users to identify general areas of concern. More specific tools such as the Abnormal Involuntary Movements Scale (AIMS), the Barnes Akathisia Scale, the Antipsychotic Non-Neurological Side Effect Rating Scale (ANNSERS) and the Arizona Sexual Experiences Scale are used to gain more detailed information about the nature of side-effects.

However, any rating scale should be used in combination with physical monitoring. Service users may be unaware that they have developed drug-induced neutropenia, which can lead to potentially fatal agranulocytosis. They may report weight gain, but without accurate records of weight and body mass index over time the extent of the problem cannot be assessed. Table 2 (p26) lists side-effect management strategies used by the community treatment team.

In terms of medication management, side-effect monitoring is extremely useful, but must be used in conjunction with treatment education. Current evidence on concordance levels and service users' beliefs and wishes relating to their treatment must also be taken into account. All this is undertaken at regular intervals and reported to the prescriber, the GP and the care programme approach care coordinator.

The prescriber then has detailed information about a service user's antipsychotic drug use from which to make evidence-based prescribing decisions, while the service user is more able to make an informed choice about treatment, validating their informed consent.

The nurse, who often administers medication, can be confident that a thorough review has been undertaken, reported and, one would hope, addressed.

Neuroendocrine adverse effects

Drug-induced sexual dysfunction can be recognised at three levels:

- The service user may report symptoms such as amenorrhoea, erectile dysfunction or reduced libido;
- Health care professionals may undertake specific rating scales to identify problems;
- Physical tests such as prolactin levels may be taken to identify hyperprolactinaemia.

Only the prolactin test will give a certain diagnosis of hyperprolactinaemia. The prolactin level is obtained by venepuncture, ideally following fasting or at least one hour after food. In the author's area the range for males is 0–500 mIU/L and females 0–700 mIU/L (milli international units per litre). When the condition is identified the team has found it is generally easy to address. In most cases a simple dose adjustment or switching to another antipsychotic will return prolactin levels to within normal parameters.

Case study

Kirsty Russell is a 44-year-old professional woman with a diagnosis of bipolar II disorder. She attends the psychiatric outpatient clinic every three months for a consultant psychiatrist review and monitoring with the community treatment team. She does not have sector community mental health team input as she has been in remission for several years. At the time of her initial prolactin screen she was prescribed carbamazepine and risperidone.

Ms Russell has a stressful job, involving daily decision-making. She generally copes well with this,

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TABLE 2. INTERVENTIONS IN ADVERSE EFFECT MONITORING

1. Side-effect rating scales (generalised): LUNBERS, SESCOAM, ANNSERS, UKU
2. Side-effect rating scales (specific): AIMS, DISCUSS, Barnes Akathisia, Arizona sexual experiences
3. Blood samples: electrolytes and urea, thyroid function, full blood count with differential, liver function, bone profile, random or fasting glucose, prolactin level, fasting lipid profile, drug plasma level (for example, for clozapine)
4. Physical observations: weight, height, BMI, pulse rate, lying/standing blood pressure, respiration, temperature
5. ECG (prescriber referral)
6. EEG (electroencephalogram) (prescriber referral)
7. Relative/carer's concerns/observations (with service user's permission)
8. General observations such as pallor, movement, speech, coordination
9. Written/verbal communication to consultant psychiatrist, GP and care coordinator

but on occasions does experience prodromal symptoms. With input from the community treatment team on identifying early warning signs, an action plan was produced which helped her to avoid relapse.

In 2003 Ms Russell reported amenorrhoea and reduced libido that had gradually worsened over several months. Prolactin level, thyroid function and fasting blood glucose tests were performed in addition to routine carbamazepine monitoring.

Thyroid function and glucose levels were within the normal range, ruling out sexual dysfunction relating to thyroid changes or diabetes. However, her prolactin level was 1,036mIU/L. Her risperidone was stopped and olanzapine 10mg was introduced.

Six weeks later Ms Russell presented with no deterioration in mental health, had resumed menstruation soon after the risperidone was stopped and was beginning to experience an increase

in libido. Her prolactin level was 113mIU/L – well within normal range.

Her libido gradually returned to normal and she was discharged from the outpatient clinic back to primary care after 20 months. Initially her level of sedation had increased on olanzapine but this was fairly short-lived. She did not experience any weight gain or glucose tolerance changes. Using a combination of early warning signs and pharmacological treatments, she has remained well in terms of mental health.

Conclusion

Sexual dysfunction in service users is not necessarily caused by elevated prolactin levels – other causal factors may be involved. The team therefore screens for thyroid dysfunction and blood glucose abnormalities, as both conditions can affect sexual functioning. If other physical or psychological factors are involved, the team refers users to sexual health services. However, this is only a small minority of individuals – in most cases hyperprolactinaemia is the cause of sexual dysfunction in patients taking antipsychotic drugs.

National guidelines, including the Maudsley prescribing guidelines (Taylor et al, 2003), recommend robust treatment for hyperprolactinaemia. However, not all trusts advocate prolactin monitoring and treatment as standard practice for service users.

The authors believe this should form part of the baseline assessment for any individual prescribed antipsychotic treatment, especially those identified as strongly associated with hyperprolactinaemia. Prolactin monitoring also allows early identification of conditions that can elevate prolactin levels. ■

Guided reflection



Use the following points to write a reflection for your PREP portfolio:

- Write about your area of work and your experience of patients taking antipsychotic medication;
- Discuss why you decided to reflect on this article for your CPD;
- Summarise any new information you have learnt about hyperprolactinaemia;
- Outline how this information will impact on your future practice;
- State how you intend to follow up this information.