

## **Benign paroxysmal positional vertigo**

DTB 2009;47:62-66

This was a really detailed review in the Drugs and Therapeutics Bulletin of a common general practice problem, so I'll cover it here in some detail too.

- **When I use the word vertigo here, I mean genuine rotatory vertigo.**

### **☒ Benign paroxysmal positional vertigo statistics**

- Common: Lifetime prevalence 2.4%
- Peak age 50-70y but can occur at any age.
- Twice as common in women as men.

*A reminder about the pathophysiology...*

*Each inner ear has 3 semicircular canals: anterior, posterior and horizontal. These run at right angles to one another. Each canal has a widened, open end (utricle) and a closed end (cupula). Within the utricle is a membrane embedded with calcium carbonate crystals (otoconia). The otoconia should remain attached to the membrane and act as weights, transmitting changes in head position to the underlying sensory hairs. If otoconia become detached they can either form free floating debris in the canal (canalithiasis) or adhere to the cupula (cupulolithiasis). The important point is that the free floating debris may continue to move once the head has stopped moving, causing a sensation of movement from the inner ear which conflicts with other sensory messages (vision, proprioception). The conflict of information gives the sensation of vertigo.*

### **Causes of benign paroxysmal positional vertigo**

- In many cases no cause is found. In 18% head trauma is identified as a cause.
- In 15 % of cases the cause is vestibular neuritis (infection/inflammation of sensory hairs supplying the vestibule).

### **Clinical features**

- Vertigo and nystagmus prompted by certain positions.
- Symptoms disappear rapidly if head kept still. If symptoms persist once stationary, then consider other causes.
- Hearing loss is not a feature.
- Rarely people have light-headedness and unsteadiness that persist between attacks.
- Nausea & vomiting occur in BPPV but also in Meniere's, migraine & vestibular neuritis.

### **Differential diagnosis**

Red flags warrant urgent specialist assessment:

- Hearing loss
- New onset headache
- CNS signs including gait ataxia.

Causes of vertigo and/or nystagmus include:

- Migraine
- TIA/CVA
- Acute vestibular neuritis
- Meniere's disease
- Perilymphatic fistula
- Acoustic neuroma
- Multiple sclerosis.

Look for associated symptoms to help elucidate these causes (eg. hearing loss, tinnitus, pain, headache, photophobia).

Drugs can cause vertigo too, particularly:

- Some anti-epileptics (carbamazepine, phenytoin)
- Antihypertensives
- Cardiovascular drugs.

## **Examination**

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- Look for a cholesteatoma.
- Look for vesicles (Ramsay Hunt syndrome from zoster).
- Assess cranial nerves, particularly looking for a sensorineural hearing loss.
- If vertigo or nystagmus can be reproduced by pushing on tragus and external auditory meatus of affected side then this suggests the presence of a perilymphatic fistula.

## **Diagnostic manoeuvre (Hallpike test)**

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The aim is to trigger the vertigo/nystagmus.

- Position the patient on the couch so that when lying down their head hangs over the back of the couch.
- Ask the patient to keep their eyes open and fixed on your forehead.
- From sitting, the patients head is turned 30-45 degrees in one direction and then they are rapidly laid down so that their head hangs below the level of the couch (about 30 degrees below the couch). Hold for up to 1 minute. Look for nystagmus which begins 5-20 seconds after reaching this position. Ask about vertigo too.
- On repeating the manoeuvre the nystagmus/vertigo should become less obvious (fatigability).

## **Which canal is affected?**

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**This matters as it affects the treatment offered.** However, having said that, 85-95% of BPPV occur in the posterior canal because of its position and the effects of gravity.

- **Posterior canal debris usually causes rotatory up-beating (geotropic) nystagmus.** Now bear with me while I explain this, the other sorts of nystagmus are easier... basically the top pole of the eyes rotates towards the undermost, affected ear whilst there is also some vertical nystagmus (eyes moving to forehead).
- **Horizontal canal debris will result in pure horizontal nystagmus.**
- **Anterior canal debris usually causes down-beating nystagmus** (but this may also be triggered by a central cause).
- **Beware of sustained or non-fatiguing nystagmus as this is unlikely to be due to BPPV (indicated CNS cause).**

## **Treatment**

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- **30-50% of people get better within 7 days without any treatment.**
- **BPPV treatment programmes tend to be based on the idea that the loose particles can be manoeuvred out of the way. These are described below in detail.**
- **Drug therapy.** There is no evidence to suggest the use of any drugs to help those with BPPV. In fact there is some evidence that vestibular sedatives actually may slow recovery if used long term as they impair the feedback that allows patients to develop compensation, which is part of the recovery.
- **Surgery** is a last resort only because permanent sensorineural deafness is not uncommon.

## **Manoeuvres to help BPPV**

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- As 30-50% get better without any treatment within 7 days, these procedures should be reserved for those with persistent or recurrent BPPV.
- The evidence base for many of these treatments comes from small, sometimes non-randomised trials, and is therefore not very strong! Importantly you must know which semi-circular canal is causing the problem as the manoeuvres vary according to which canal is trying to be cleared.

*You can read about the different treatments in detail below, or skip straight to 'what does this mean in practice' for the bottom line.*

## **Treating posterior canal debris**

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- **The posterior canal is affected most commonly (85-95% of the time and causes rotatory up-beating (geotropic) nystagmus).**

Three treatments have been suggested for clearing the posterior canal, however the evidence base for one is insufficient (Semont manoeuvre, so I'll not mention this again).

The other two suggested therapies are Brandt-Daroff and Epley manoeuvre's.

### **Brandt-Daroff exercises (self-treatment)**

From sitting, the patient rapidly moves to the position that triggers symptoms (usually nose up, with lateral aspect of occiput resting on bed – so not dissimilar to Hallpike, but without dangling off the edge of the bed). Hold the position for 30s or until vertigo subsides.

Sit up again for 30s.

Then lie down again, but this time turning the head in the opposite direction for 30s, then sit up again.

It is recommended that the patient does these every 3 hours whilst awake until they have 2 vertigo free days.

### **Does it work?**

Evidence for efficacy comes from a study of 124 people randomised to Brandt-Daroff exercises v sham movements and those doing the Brandt-Daroff manoeuvres had less vertigo over a 60 day period.

### **Epley Manoeuvre**

Five basic movements that aim to clear debris from the posterior canal. Watch it on video to see how to do it (see useful websites, below).

Modified Epley manoeuvre has now been developed which patients can do at home without a health professional. The modification comes from the pillow which raises the shoulders and allows the head to rest on the bed (onto dangling over the edge), but still below the horizontal plane.

### **Does it work?**

- **Conventional Epley has good evidence of benefit – NNT of 2-4, with benefit within 1 day to 4 weeks.**
- Restricting activities post- procedure (sometimes still recommended) does not improve efficacy and is not required.
- Modified Epley was shown in one trial to be more effective than Brandt-Daroff, but a systematic review suggested insufficient evidence to know whether modified Epley was more beneficial than any other procedure, including Brandt-Daroff.

### **Treating horizontal canal BPPV**

- **These people present with pure horizontal nystagmus on the Hallpike test.**

**Treatment is using the barbecue manoeuvre!**

Start with the patient lying down, face up. Move the patient so they are lying on one side. Then, when the nystagmus settles, move so they are face down, wait for nystagmus to settle, turn onto the other side, wait, then onto the back again. It is important to keep turning in the same direction, and to wait for the nystagmus/vertigo to settle after each movement.

#### **Does it work?**

Low quality studies suggested it may work, but little allowance was made for the fact that left alone the condition tends to improve anyway.

### **Treating anterior canal BPPV**

- **These people present with down-beating nystagmus on the Hallpike test.**

Various manoeuvres have been suggested including:

Whilst sitting, turn the head 45 degrees towards the unaffected side, lie down, so that the head remains turned to one side and hangs 30 degrees below the end of the bed. Hold for 2mins. Sit up again, keeping the head turned to the unaffected side, hold for 1minute, move head back to midline, tilting shin down by 30 degrees.

#### **Does it work?**

This is the rarest form of BPPV and has the smallest evidence base for therapy – which means there is virtually no data of sufficient quality to know whether it works!

### **So what does all this mean in practice?**

- **The DTB concludes that Epley manoeuvres should be offered to those with posterior canal BPPV, and they could try Brandt-Daroff at home if they so wished, acknowledging the weak evidence base.**
- **Drug therapy, particularly vestibular sedatives, are not encouraged.**
- **Surgery is reserved as a last resort.**

<b>Useful Websites</b>	<p><b>For professionals:</b>  <i>Watch how to do Epley manoeuvre on line!:</i>  <a href="http://emedicine.medscape.com/article/791414-media">http://emedicine.medscape.com/article/791414-media</a></p> <p><b>For patients:</b>  <i>A patient information leaflet on Epley manoeuvre:</i>  <a href="http://www.gloshospita;:s/nhs.uk/ppi/leaflets/pdf/GHPI0820.pdf">http://www.gloshospita;:s/nhs.uk/ppi/leaflets/pdf/GHPI0820.pdf</a></p> <p><i>A sequence of pictures showing patients how to do the Bandt-Daroff manoeuvres:</i>  <a href="http://www.tchain.com/otoneurology/disorders/bppv/brandt/first.html">http://www.tchain.com/otoneurology/disorders/bppv/brandt/first.html</a></p>	<b>Useful Websites</b>
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#### **CPD Ideas**

*Are you confident in your diagnosis of BPPV and the use of the Hallpike test? You could practice with a colleague if you are not sure. Equally you could have a go at working out some of the treatment manoeuvres.*

*If you don't know who offers Epley manoeuvres locally, you could find out.*

**Take home messages: Benign Paroxysmal Positional Vertigo**

- Relatively common in general practice.
- Diagnosis is based on history, examination and particularly the Hallpike test.
- Be sure to exclude more sinister causes, checking particularly for any hearing loss, tinnitus, pain, headache or photophobia.
- Consider drugs as a cause.
- Identify the canal affected from the nystagmus triggered in the Hallpike test.
- Consider manoeuvres to improve symptoms, noting the poor evidence base.
- For posterior canal BPPV (the commonest form), Epley manoeuvre is recommended until recovery. The Brandt-Daroff home treatment programme can be tried, although evidence is limited.

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