

# COGNITION & maintenance of balance

Maintenance of balance involves:-

-understanding (acquiring knowledge) of ongoing reality through the visual, proprioceptive and vestibular senses *-perception,*

-establishing coherence between these different sensory inputs and by comparing with previously stored experiences *– integration & memory recall*

-integrating the inputs in the brain to comprehend the reality about the stability of the ground & the surroundings

-executing a motor action based on the integrated inputs to maintain stability and prevent a fall *–execution of a programmed response*

*This is a real cognitive process*



# COGNITION & maintenance of balance

*(contd)*

Maintenance of balance involves:-

- Adaptation to the ongoing reality and storing in the brain (memorisation of) experiences learnt pertaining to the maintenance of balance
- Prediction of the expected response by comparing with the previously stored experiences
- Innovating (usually by intuition ) newer strategies to maintain balance when similar experiences are not stored in the brain or when contradictory inputs are received in the brain

*All these too are real cognitive processes*

# COGNITION & maintenance of balance

*Maintenance of balance as well as the process of vestibular compensation is all about:-*

- learning and re-learning (*acquiring knowledge*) how to make best use of the available inputs
- evolve strategies (*reasoning using past experiences stored in memory*) about how to stay erect and prevent a fall
- achieve a goal by contracting some body muscles (*executing an action*) both in health as well as in disease

*all of which together is a **COGNITIVE** process*

# COGNITION & Vestibular Compensation

*Compensation and Adaptation involves:-*

- Intelligently utilising the available inputs to maintain balance after a vestibular damage has taken place
- Evolving newer strategies to maintain balance as requisite inputs are not available after a vestibular damage

Both these are **COGNITIVE** processes

# PSYCHIC impact of BALANCE DISORDERS

- 64% of vertigo patients had psychiatric symptoms
  - Kenna, Hallam, Hinchcliff *Otolaryngol* 1991
- 45% of vertigo patients had panic symptoms
  - Cleark, Hirsch, Smith *Am J. Psychiatry* 1994

## Studies show :-

**22 to 67%** incidence of anxiety & agoraphobia in dizziness patients

**39 to 88%** incidence of vestibular abnormality in panic patients.



# The vestibular –psychiatric interrelationship :-

1. Psychiatric patient (esp. schizophrenics) more susceptible to motion sickness
2. Schizophrenic patients have higher incidence of abnormal findings on vestibular function test
3. Dizziness/instability is one of the common features of panic attacks
4. Incidence of definite psychiatric disorder very high in patients with proved vestibular dysfunction.

## The vestibular –psychiatric interrelationship (Contd.) :-

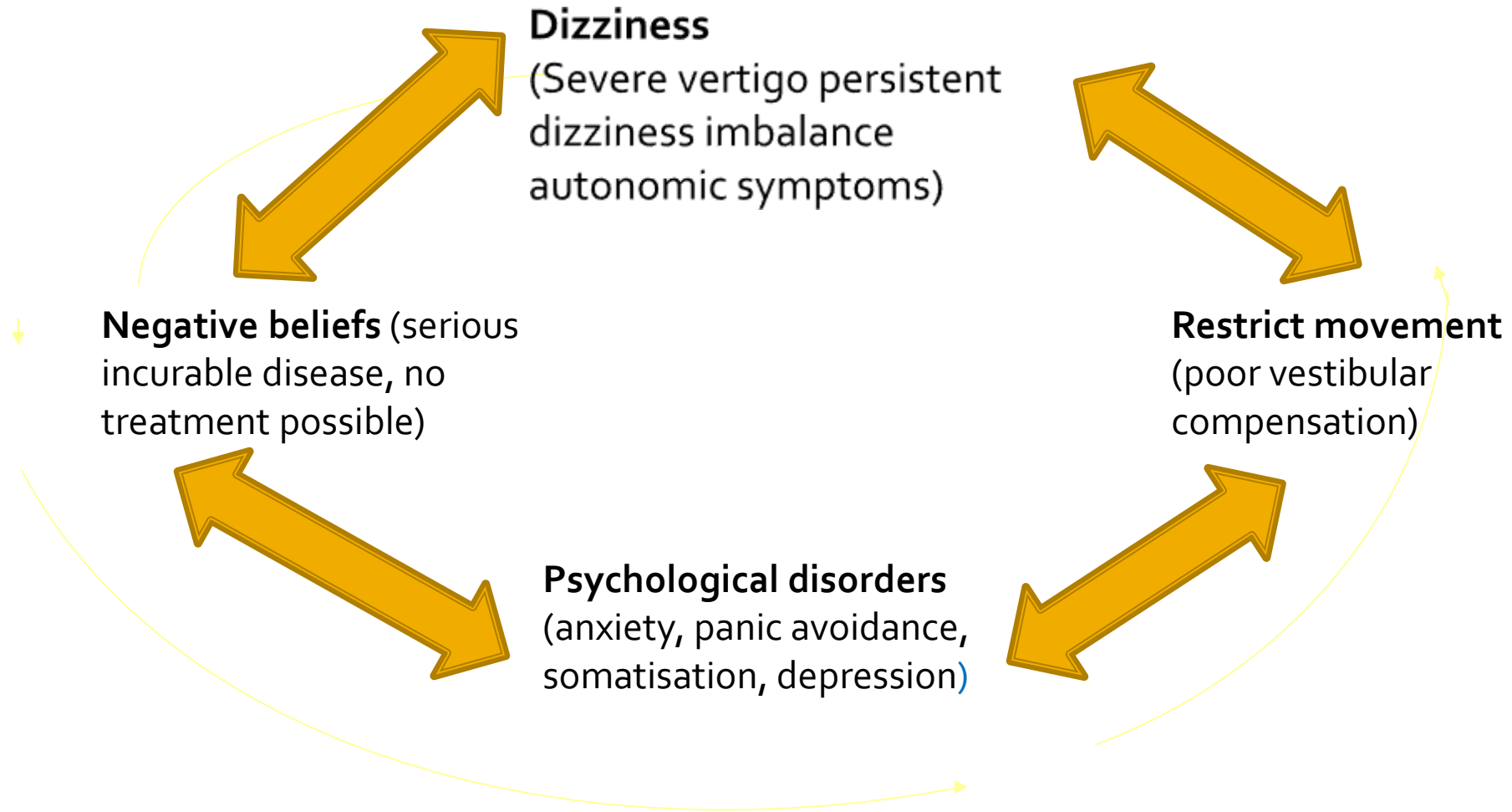
5. Vestibular disorder patients have very high incidence of abnormality in psychometric test.

6. Better clinical

7. **Correction of psychic and cognitive deficits is a part of the therapy & much better treatment outcomes are obtained when these factors are attended to** has been established between

systems.

# A vicious cycle.....





## Psychological disorders commonly encountered in dizziness patients :-

- **Anxiety**
- **Helplessness**
- **Agoraphobia**
- **Somatisation (hypochondria)**
- **Depression**
- **Conversion disorders**



# MANAGEMENT

## 1. **Reassurance** : explanation about

- benign nature of pathology
- dizziness & psychopathology interrelationship
- high prevalence of disorder

## 2. **Psychotherapy**

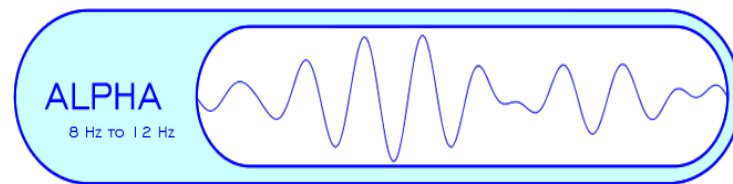
- cognitive behavioral therapy
- psychotherapy

## 3. **Pharmacotherapy**

- benzodiazepins
- antidepressants



**A new medication claimed to be non-CNS depressant to reduce stress and manage sleeplessness**



Mental Relaxation

***Combination of LACTIUM & L-THIANINE***

- **LACTIUM** is an bioactive decapeptide having relaxing properties, derived from milk



- **L-THEANINE** is naturally occurring amino acid mainly found in Green tea leaves



Claimed to be World's only proven anti-stress therapy

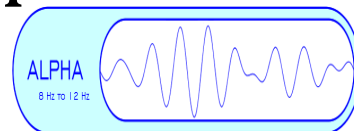


Safety approved by



## Claims from the manufacturers

- Effective and safe formula for managing stress & disturbed sleep
- Clinically proven efficacy and safety in numerous trials
- Clinically proven to reduce physical, physiological and psychological symptoms of stress (e.g., digestive, cardiovascular, intellectual, social & emotional symptoms)
- Stimulates brain alpha waves and induces relaxation within 40 mins



## Manufacturers produced literature showing that the drug :-

- Reduces Cortisol level – Major biomarker of stress
- Improves sleep quality & restores natural sleep
- Completely safe and no scary adverse effects  
(*does not cause sedation, habituation, addiction, dependence, memory impairment etc.*)



# The antivertigo drugs- *an analytical if not a cynical review*





# Finding out the least harmful one !!

1. Dimenhydrinate
2. Diazepam
3. Prochlorperazine
4. Promethazine
5. Cinnarizine
6. Betahistine
7. Meclizine
8. Ginkgo biloba



# PROCHLORPERAZINE

- belongs to the phenothiazine group of antipsychotics – *known to induce extrapyramidal disorders like PARKINSONISM, chorea, dystonia with oculogyric crisis, spasticity, opisthotonus, torticollis, etc.*
- pharmacologically recommended for acute vertigo
- has antihistaminic (H1), anticholinergic (AChE), and antidopaminergic (D1, D2) properties
- best drug for symptomatic relief in acute vertigo.
- vegetative symptoms that accompany acute vertigo like nausea, vomiting are greatly relieved.

**too many side-effects that  
clinicians need to be aware of**



# ADVERSE EFFECTS OF PROCHLORPERAZINE

- ▶ **Extrapyramidal** effects like acute dystonic reactions, oculogyric crises, pseudo parkinsonism and akathisia are the major drawbacks - more common in children and adolescents.
- ▶ can also cause a life threatening condition called **neuroleptic malignant syndrome**
- ▶ sublingual preparation sometimes causes local erosive **cheilitis of lips and tongue** (patient can swallow the tablet in such situation)
- ▶ Hypotension, esp **orthostatic hypotension** not uncommon
- ▶ **anticholinergic effects** are often very distressing for the patient