Anosognosia in Hemiplegia (AHP): Assessment and Intervention

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Working Definitions

• **Anosognosia** refers to a mismatch between client’s estimate of ability (or consequence) and reality of impairment (Aimola Davies et al, 2007, 2010)

• **Explicit (Verbal) Anosognosia** refers to person who verbally denies he/she has a problem but shows behaviors consistent with paralysis (executing a bimanual tasks using a unimanual strategy)

• **Implicit (Behavioral) Anosognosia** refers to person who verbally accepts the paralysis but behaves in a manner inconsistent with the acceptance (attempts to walk)

• Based on Jenkinson, Preston & Ellis, 2012
Diagnoses Associated with Anosognosia

In this presentation
• Stroke - hemiplegia
• Traumatic (Acquired) Brain injury - hemiplegia

Others
• Alzheimer’s disease
• Brain lesions
• Brain tumors
• Dementia
• Huntington’s disease
• Neurodegenerative disorders, unspecified
• Parkinson’s disease
• Schizophrenia
Case Example

- 89-year-old woman, right-hemisphere stroke, left hemiplegia
- Six months post
- Self-rated strength of left
  - hand and wrist, 0 out of 10 (10 normal, no problem)
  - hip, knee, ankle and foot 2 out of 10
- Claimed she could look after herself unaided and even walk upstairs
- Reality: Confined to a wheelchair
- Assessment of impairment correct, assessment of consequences to performance incorrect (mismatch).
Case Study

• Male 47, closed head injury, MVA, frontal lobe damage to both hemispheres
• 6 months post, still has left limb paralysis
• Interview at 6 months
  – Neuropsychologist: How are you?
  – NS: I’m fine, really fine
  – NP: Why are you in the hospital?
  – NS: Having a routine check-up
  – NP: Why are in a wheelchair?
  – NS: Perhaps I fell from my bicycle and bruised by leg (touching his right leg). Note: NS ignores left limbs.
Case Study Continued

– NP: Could you go surfing should you wish to do so?
– NS: Why not, if the wind is strong enough.
– NP: Could another person in your situations surf?
– NS: Yes, though not much. One needs some vigor that I am lacking at the moment (Note: Attributes problems to another cause)
– NP: Would you manage to hold on?
– NS: I think I would, though standing up I might have some balance problems.
– NP: What if you were sitting on it.
– NS: Well in that case, I would have no problems at all.
  • Cocchini, Beschin, Della Sala (2002)
Who Cares?

• Symptoms most pronounced during **acute care** phase (first few days post stroke when person receives hospital-based therapy).

• Client may:
  – have **unrealistic performance goals** (I can do everything I used to do).
  – **say** to family and friends he/she **can do something**, he/she **cannot do** such as walk. Client falls and hurts self.
  – **say** to family and friends that he/she **cannot do** something and **then do it**, leading family and friends to think he/she is faking a disability to get extra attention and help.
  – **refuse to participate** (or passively participate) in rehabilitation program because in his/her mind “**nothing is wrong** with me” so no therapy is needed.
-And More of the Same

• Client may
  – have sensory loss (proprioception) and be “lost in space” regarding hemiplegic side but not know to take precautions.
  – have difficulty performing or fail to perform ADL tasks especially eating, dressing and bathing due to “lack of awareness” or “disowning.”
  – “cover” for disability by saying he/she can do it but is “too tired” or “did it yesterday” so no need to repeat. Confabulation.

• Caregivers need to be
  – concerned for safety due to client’s potential decreased awareness of body parts and body in space.
  – aware that there may a mismatch between verbal words (what client says) and motor behavior (what client does). Watch for confabulation.

• Note: Anasognosia often co-exists with unilateral neglect. If unilateral neglect is present, check for anasognosia.
Summary of Possible Symptoms

- Lack of awareness of deficit
- Overestimation of abilities despite paralysis or paresis
- States capable of moving a paretic limb
- Ascribes impairment to other causes (arthritis, tiredness)
- Disclaims ownership of a limb
- False belief persists despite logical arguments contradictory evidence
- Produces bizarre or avoidance explanations to defend conviction (confabulation)
- Unduly optimistic about prognosis
- May be aware of other illnesses such as arthritis or diabetes but not of hemiplegia or paralysis
Summary of Issues

• Person may not be aware of:
  – having a deficit or impairment (e.g., my left arm (leg) is weak or paralyzed)
  – the consequences of having a deficit or impairment (e.g., I cannot move my arm or leg)
  – tasks, activities, or occupations (functional performances) that will be affected (e.g.,
    • Person cannot hold a bottle in one hand and unscrew the cap with the other (two-handed activity;
    • Person cannot hold a tray with both hands (bilateral);
    • Person cannot walk (reciprocal or alternating movement)

• Any combination of the three
Incidence

• Incidence differs depending on stage (time) since stroke.

• Stage and frequency
  – Hyperacute (3 days) = 32%
  – Subacute (1 week) = 18%
  – Chronic (6 months) = 5%
    – Vocat, Staub, Stroppini, & Vuilleumier, 2010

• Caution:
  – Low incidence in subacute or chronic phase may be result of diagnostic tools used, rather that actual recovery.
  – Or may be result of learned responses
Duration

• Usually spontaneous recovery occurs within days or weeks post stroke
• Explicit and implicit awareness may recover at different times in same client
• Recovery coincides with decrease in deficits of
  – 1) proprioception,
  – 2) visuospatial neglect and
  – 3) temporospatial disorientation
• Chronic anosognosia (present at 6 months) linked to ongoing visuospatial neglect, memory impairment and temporospatial disorientation.
• Jenkinson, Preston & Ellis, 2012
Theories and Explanations

• **Neuropsychological** – anosognosia is a consequence of global cognitive impairment which result in a variety of symptoms

• **Neuroanatonomical**
  
  – *Hemispheric damage* – damage to the right hemisphere changes the dynamic interaction between the two hemispheres (dominant and non-dominant) resulting in symptoms
  
  – *Intra-hemispheric localization* - specific lesions in the brain result in particular symptoms
Types of Assessments

• **Interviews**: Direct questions about client’s deficit. Require verbal answers

• **Therapist Rating**: Evaluating client’s ability to perform motor tasks

• **Self (Client) Rating**: Client estimation of performance ability before and after having performed specific tasks

• Note: Only assessments for motor performance are reviewed, not memory
  
  • Cocchini, Beschin, Fotopoulou & Della Sala (2010)
Assessment – Cutting, 1978

• Why are you here?
• What is the matter with you?
• Is there anything wrong with your arm or leg?
• Is it weak, paralyzed or numb?
• How does it feel?
• (Arm picked up) What is this?
• Can you lift it?
• You clearly have some problem with this?
• (Asked to life arms) Can’t you see that the two arms are not at the same level?
Assessment – Bisiach, 1986

• 0 – The disorder is spontaneously reported or mentioned by the patient following a general question about his complaints
• 1 – The disorder is reported only following a specific question about the strength of the patient’s left limbs
• 2 – The disorder is acknowledged only after its demonstration through routine techniques of neurological examination
• 3 – No acknowledgement of the disorder can be obtained
• General Interpretation: Lower score, better prognosis
Assessment for Implicit Anosognosia (Cochini et al, 2010)

• Eight tasks
  – To hold a two-handle tray
  – To wear (put on) a glove on the unaffected hand
  – To place toothpaste on a toothbrush
  – To crack a hazelnut (could substitute another type of nut)
  – To open a bottle (remove a cork or lid)
  – To open an umbrella
  – To clap hands
  – To open a heavy book (hold in one hand)

• Client evaluated as to strategy used: two-hands (no motor disorder), one-hand successful (awareness strategy), one-hand failure (anosognosia)
Assessment for Implicit Anosognosia
Cochini et al, 2010

Tray
Gloves
Toothpaste & brush
Nut & nutcracker

Bottle & lid
Umbrella
Clasp hands
Open/hold book
Examples of Failures

• Tray falls or is inclined (tilted) on one side
• Glove remains on table and cannot be worn
• Toothpaste (or toothbrush) remains on table and not toothpaste is applied
• Hazelnut or nutcracker remains on the table and hazelnut cannot be cracked
• Bottle or corkscrew remains on table and corkscrew is not in contact with cork
• Umbrella remains on the table folded
• No clapping sound
• Book remains closed
Unimanual, Bimanual Tasks
(Marcel et al, 2004)

Unimanual
• Drink a glass of water
• Comb hair
• Brush Teeth
• Write name
• Unlock door

Bimanual
• Tie a knot
• Clap hands
• Shuffle cards
• Row a boat
• Catch a beach ball
• Wash one’s hands
• Unscrew a bottle
• Cut a loaf of bread
Model for Intervention

- **Intellectual awareness**: client has a basic knowledge of the deficits and implications
- **Emergent (concurrent) awareness**: client can recognize impact of deficits while performing a task
- **Anticipatory awareness**: client is able to predict how he/she will perform on a particular task and/or whether a problem will occur given the deficits.
Intervention Strategies

• Visual feedback (self-observation approaches
  – Video feedback (action observation therapy)
  – Mirror training
  – Mirror reversal therapy
• Motor: bimanual coupling
• Environmental structuring/modification
• Reality checking
• Mental rehearsal
• Vestibular stimulation
• Caregiver education
• Dealing with Confabulation
Visual feedback: Video

• Client observes video taped sessions of his / her performance of daily life hand, arm, and leg actions
• Useful for clients who lack motivation or physical ability to engage in more physically active treatment
• May seem to client to be less judgmental than a therapist critiquing the performance
• After viewing, client can try again
• Fotopoulou et al, 2009
Visual feedback: Mirror

• A full length mirror is placed in front of the client so client can observe movement (or lack of movement) of hand, arm, or leg during the performance (attempted performance) of a task.

• Mirror reversal therapy: Mirror is placed along the body midline. “Good” limb is moved which provide false visual feedback that paralyzed limb is moving.

• Same technique as used to treatment “phantom limb” in amputation.
Environmental Structuring/Modification

- Fall prevention protocol: No rugs, no slippery surfaces, walk-in shower, use chairs with arm-rests
- Supervision: Observe and use body or belt to protect person when sitting on side of bed, transferring, standing, walking
Reality Checking

• Experience: Have person discover paralysis by observing failure in tasks requiring movement of the affected limb(s). Provide safety control.

• Feedback: Provide non judgmental feedback regarding deficit. Tell person what he/she can or cannot do. Provide safety control.

• Personal inventory: Have person write down pros and cons of problem(s) being addressed.
Mental Rehearsal & Bimanual Coupling

• Practicing movements involving the paralyzed limb using imagination or imagery.
• Use actual tasks or roles actually performed by the person in everyday life.
• Client is asked to simultaneously trace out lines with unaffected hand and circles with the paralyzed hand.
• Garbarini et al, 2012
Caloric Vestibular Stimulation

• Left external ear canal is irrigated with 20 cc of iced water for 1 minute (Right ear may also be stimulated)
• Usually a right nystagmus is seen
• Client usually report discomfort
• Results mixed and may be temporary (Cappa et al, 1987; Rode et al, 1992; Ronchi et al, 2013)
Caregiver Education

• Explain anosognosia (unawareness syndrome) to caregivers
• Explain how client is affected. Give examples
• Assure caregivers the person is not mentally ill (crazy, off her/her rocker). Anosognosia is part of disorders occurring after a stroke
• Provide techniques for managing disorder
Dealing with Confabulation

- Confabulation results in misinformation, inaccurate information or confusing information to caregivers & others
- Explain to staff, family, and friends how confabulation is constructed and influenced by social context
- Discourage rehabilitation staff from confirming or contradicting client’s confabulations
- Use individual session to progressively explore the subjective meaning of confabulation and provide nonthreatening feedback. In OT use daily activities and typical movement patterns.
- Build rapport with client by initially discussing negative experiences, vulnerability, and disability using the third person perspective such as “people who suffer a stroke may have difficulty at first moving an arm or a leg.”
Outcome

• The presence of anosognosia and unilateral neglect worsens the rehabilitation prognosis in hemiplegia (Gialanella et al, 2005)

• Therapists should be alert to presence of anosognosia (and unilateral neglect) so planning immediate care and discharge can take issues related to anosognosia into account.
Take Away Message

• Both verbal and motor responses must be assessed and cross checked for consistency (or inconsistency)

• The date on which the symptoms have resolved should be noted in documentation if resolution has occurred before discharge. Continuing or chronic anasognosia should be noted in discharge summary.

• Occupational therapy personnel may need to take the lead in alerting caregivers to anasognosia and its effect on daily functioning.
References


References


