THERAPEUTIC PERSPECTIVES IN SPEECH-LANGUAGE PATHOLOGY: TREATMENT IN RIGHT AND LEFT HEMISPHERE STROKE

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PRESENTATION OUTLINE

- Left Hemisphere (LH) and Right Hemisphere (RH) Communicative Profiles
- Factors Influencing Treatment Outcomes
- General Approaches to Treatment
- Treatment Directions Associated with LH and RH Strokes
- Overall Intervention Perspectives
SPEECH-LANGUAGE AND COMMUNICATIVE PROFILES
LEFT HEMISPHERE STROKE: APHASIA AND RELATED DISORDERS
Vascular disorders

Type of aphasia observed depending on the vascular territory

Main trunk of the left middle cerebral artery
  Orbitofrontal, pre-rolandic
  Rolandic
  Parietal anterior
  Posterior parietal, angular
  Temporal
  Perforating

Global aphasia
  Broca aphasia
  Dysarthria
  Conduction aphasia
  Sensory extrasylvian
  Wernicke aphasia
  Dysarthria, subcortical aphasia
  Aphasia of the supplementary motor area
  Alexia w/o agraphia

Anterior cerebral artery

Posterior cerebral artery
BASIC CHARACTERISTICS OF APHASIA

**Spoken Language**
- Anomia
- Paraphasias
- Jargon
- Agrammatism
- Problems in Repetition
- Abnormal Fluency

**Written Language**
- Visual Comprehension/Reading
- Auditory Comprehension
RIGHT HEMISPHERE STROKE:
COGNITIVE-COMMUNICATIVE
IMPAIRMENTS
RH brain damage/stroke: does not disrupt a set of symbolic LANGUAGE behaviors

Unlike LH aphasic patients: RH patients typically have...adequate linguistic system with phonology, syntax, and lexical choice intact.

RH damage interferes with more general response to experience.

That is, RH patients may have some specific linguistic deficits, BUT: overly dependent on linguistic system.

Respond based on faulty/inadequate perceptions of their environment
Communication problems associated with RH stroke are a product of concomitant cognitive deficits.

Communicative effectiveness varies significantly relative to the nature and severity of their cognitive-communicative disorder.

Communication problems arise from: impairments in perception, attention, memory, and executive functioning.
Attention and perceptual deficits affect ALL levels of experiential processing including utilizing environmental context to shape communication.

Because of these low level deficits, continuous theme of impaired functioning in all aspects of behavior; yields difficulties in communicative and linguistic interaction.
FACTORS INFLUENCING TREATMENT OUTCOMES
CURRENT FACTORS INFLUENCING TREATMENT OUTCOMES

1. Typically Accepted Models of Language and Communication Outcomes After Stroke
2. Influence of Aging Process and Associated Health Problems on Compromised Systems
3. Role of Improved Stroke Prevention and Stroke Care on Communication Profiles
Typical Models of Language & Communication After Stroke

- LH stroke yields aphasia and/or accompanying speech and language problems only.
- RH stroke yields neglect, facial recognition deficits, memory problems with confabulation syndrome, etc. with little to no emphasis on language and particularly communication.

These perspectives are not inaccurate: they are just incomplete and yes, at times may be inaccurate.
LH strokes:

- Need to consider more than classification of type of aphasia based on classical systems.
- Need to refine understanding of lesion site relative to vascular insult and behavioral outcome.
- Need to use psycholinguistic process approach to understand patient’s language profile in light of different communication behaviors that may be affected by more general impairments.
  - for example, need to understand the impact of an auditory comprehension deficit on other skills.
RH stroke:
- RH participates in more functions than visual perceptual processing and directed attention.
- RH contributes uniquely to language processing and communicative interaction.
- However, to adequately treat cognitive-communicative problems associated with RH stroke, need to go beyond this explanation of function.
RH stroke (cont’d):

- Imperative to understand bases of deficits such as neglect, facial recognition, etc.
- Underlying bases for these deficits as well as deficits themselves are major contributors to language and cognitive-communication problems experienced.
Role of aging process and accompanying health problems interact with already fragile and compromised neurological and communication systems after stroke.

Consider behavioral outcomes:
- relative to these factors
- impact on communication outcomes for stroke patients
- not completely understood and interpreted.
What WE DO KNOW AND OBSERVE is site of lesion of stroke, in conjunction with patient age and health, sometimes influences communication outcome.
AGING AND ACCOMPANYING HEALTH PROBLEMS

- LH stroke patients:
  - Increasing age and significant health issues often yields patients that do not just exhibit aphasia; also may show dementia
  - Not Alzheimer’s based cause of dementia, but it is dementia that is very variable.
RH stroke patients:

- also may demonstrate dementia of different severity levels.
- may appear to have reduced intelligence.
- Furthermore, some individuals may appear psychotic and in fact have this diagnosis documented.
However:

- For RH population in particular, it is relevant to consider underlying nature of disorders such as neglect, confabulation, etc. as well as compounding effects of aging and health conditions.

- Provides more insight into treating communicative patterns shown by individual.
Thrombolysis care: extended window of care as well as new thrombolytic treatments

Oral therapy for atrial fibrillation

Improved selection data for endarterectomy surgery; use of carotid stenting

Use of these and other medical therapies over last 15 years have yielded a remarkable increased survival rate from stroke.
This Increased survival rate yields different and more unique communication profiles.

Typical communication and aphasia classification systems based on anatomical foundations not as effective as heuristic devices relative to treatment of current stroke communication outcomes.

This has resulted in some abandonment of purely neuropsychological perspectives as well as decreased referral and treatment of stroke patients for treatment of communication and language problems.
GENERAL APPROACHES TO TREATMENT
BEHAVIORAL STIMULATION APPROACH

- Emphasize:
  - understanding what stimulus factors impede linguistic abilities
  - enhance patient’s current linguistic abilities

- Expose patients to stimulus and task hierarchies that stimulate functioning of compromised language functions and modalities
Use of models of normal and/or disordered language to motivate treatment targets/procedures

Based on comprehensive assessment that delineates which specific linguistic processes are compromised

Focus treatment on improving disrupted processes or capitalizing on more intact processes

Then evaluate:
- how therapy affected change in treated linguistic stimuli, functions, and modalities
- did treatment process generalize to untreated contexts and stimuli
NEUROPSYCHOLOGICAL-NEUROLOGICAL APPROACH

- Treatment decisions are made based on anatomical and physiological considerations of the brain and nervous systems.
- Heuristic frameworks that have developed over last few centuries relative to brain, language, and communicative functioning continue to be critical to understanding of preserved and disrupted abilities after stroke including recovery process.
- These frameworks have identified unique capacities and functions of each hemisphere as well as acknowledged differences in cognitive processing style of two hemispheres.
- Should continue to be part of total evidence-based practice model to treat communication disorders after stroke.
SPECIFIC TREATMENT DIRECTIONS
APHASIA AND LH BRAIN DAMAGE

- **Efficacy of treatment:** do specific treatments work

- **Effectiveness of treatment:** how do specific treatments work in routine clinical settings

- **Efficiency of treatment:** how can specific treatments be most beneficial to patients
EFFICACIOUS APHASIA TREATMENTS
CONSTRAINT INDUCED LANGUAGE THERAPY:

- incorporates notion of learned nonuse
- limits patient’s response modality to verbal production through use of visual barriers
- Progressively more difficult responses are shaped in gradual, successive approximation of behavior in small steps
- Therapy tasks should consist of structured language output activities
CONSTRAINT INDUCED LANGUAGE THERAPY:

- Key task components should involve request or question by patient followed by clinician response; request and response has to be successfully received by patient for “turn” to be over.
- Stimuli are manipulated to increase/decrease task difficulty through changing characteristics of items and requirements of response.
- Cueing is provided if necessary to reduce error.
- Similar to PACE as there is required exchange of information between clinician and patient; however, “constraint” of verbal production.
Semantic Feature Analysis (SFA) (feature generation)

- Goal: activate semantic network via eliciting semantic features to which the target item belongs
  - activation of features should facilitate access to and production of target items
  - patients should begin to independently generate semantic features to self-cue themselves
  - can be used with various types of aphasic patients
  - Charts/organizer are used to help patients generate words semantically related to target items
  - patients shown picture (target); asked to name picture as well as generating various semantic features of target.
V-NEST: Verb Network Strengthening Treatment

- semantic feature approach for verbs as you are considering who, what, where, when, and why
- focuses on the agents and patients of verbs
- agents are who does the action; patients are who/what receives the action
- prepare verb cards with many actions and patients for each verb
- lots of cueing with focus on comprehension in early parts of program and production in later stages of program
DIRECT APPROACHES

SCRIPTS

- script is developed focusing on life relevant information with varying length and complexity depending upon patient.
- patient listens to scripts a few times which can be computerized, read aloud, or written out.
- repeated practice of each sentence with choral reading, written cues if needed, individual words or sounds if needed.
- practice complete script with clinician or communicative partner.
Training Communication Partners

- identify communicative behaviors that disrupt communication; work to eliminate those behaviors
- provide structured training in behaviors that support successful interactions with patient

**behaviors include:**
- acknowledgement of communicative attempts
- congruent overlap (cues indicating listener has understood message)
- facilitating, using, and understanding multiple modalities as means of communication between partners
Supportive Conversation for Adults with Aphasia:

- **Natural adult talk** with tone and style appropriate for context and sensitivity to conversation partner.

- **Trains conversation partners to ensure:**
  - patient understands what is being communicated
  - patient has a means of responding
  - verification that message received was that intended by patient.

- **Uses verbal and nonverbal strategies**
Several different theories proposed relative to nature of RH cognitive-communicative disorders: some overlap:

- Cognitive Resources Hypothesis
- Coarse Coding Deficit Hypothesis
- Suppression Deficit Hypothesis
- Pragmatic Deficit Hypothesis
- Social Cognition Hypothesis

All of these hypotheses consider the underlying basis of the disorder in deciding on focus of treatment.
Rehabilitation Issues

- Heterogeneity of symptom presentation: lack of sound definition of the disorders; makes it difficult at times to know what characterizes patients.

- Dearth of explicit, testable models of domains and systems that support interpersonal communication; vast range of normal in these domains and systems; makes it difficult to discern what is disordered.

- Still preliminary understanding of the nature of these disorders.

- Creates challenge for tailoring treatments with best chance of extra-clinic generalization and important daily life outcomes.
Rehabilitation Approaches

- Clinicians typically approach treatment from a medical model perspective: identify and try to fix impairments. Skilled clinicians think beyond the level of the deficit.

- Multidimensional applied cognitive rehabilitation approach points us away from the mere existence of deficits and toward the functional impact of those deficits.
  - Conceptualizes treatment as a process of addressing obstacles to patients’ attainment of their own goals.
  - Deficits are appropriate for direct treatment only when they create meaningful obstacles to goal attainment. Other obstacles may be factors outside of the patients themselves.
Rehabilitation Approaches

- Behavioral rehabilitation focuses on restoration; aims to improve underpinnings of deficient performance.

- Renewed emphasis on restorative treatments stems from increasing evidence of brain plasticity, which seems to be exploited by intensive rehabilitation, even long postonset stroke.

- Treatment also can take a compensatory focus, to work around existing deficits.
EVIDENCE:
Extensive research evidence on treatments for unilateral neglect; otherwise, evidence base for RH population is just emerging.
Approaches providing patient with impression that environment has been shifted towards neglected side include:

- Monocular eye patching: blocking or shading lens of non-neglected side.
- Prism lenses: with wearing, cause natural adjustment of eyes in which visual focus shifts toward neglected side.
- Exciting vestibular organs on neglected side via ear irrigation or visual motion stimulation.

Neglect improvement may dissipate after these devices or stimulation have been removed

- Expected; these adaptations do not fix neglect
- Instead: change variables in environment, modify task demands, or alter visual input.
Neglect treatment: also involves remediating cognitive problems contributing to neglect.

- increase active attention to neglected side.
- Patients practice activities in which they demonstrate neglect; during practice, clinicians provide cues (verbal, visual, auditory, tactile) to encourage attention to neglected side.
- Over time, clinician cuing is faded as performance improves.
- Patients should also be taught to cue themselves; can be implemented as long as patients are sufficiently aware of their neglect and consequences of their neglect.
Limb activation: technique that patients learn as self-cue/strategy to help decrease neglect symptoms.

- Patient trained to move some part of neglected side of body in neglected hemi-space while completing daily activities that are negatively affected by neglect.
- Limb movement proposed to decrease neglect symptoms by increasing activation within neural areas of damaged hemisphere contributing to attention.
- Cueing approach: training proceeds with clinician initially reminding patients to use limb activation while they complete therapy activities.

Obviously, this technique is inappropriate for patients with dense hemi-plegia.
OVERALL INTERVENTION PERSPECTIVES
OUTCOME RECOMMENDATIONS

- Should consider factors affecting communication outcomes as well as general treatment approaches for productive treatment outcomes.
- Thus, relative to best practices care for our patients, an integrative treatment perspective may be most effective.
As clinicians, scientists/researchers, physicians:

- Incorporate all approaches in treatment of stroke patients
- Integration of traditional models of patient behavior, cognitive functioning, and brain anatomy/neurophysiology
- Better understanding of current factors of practice are imperative because:
  - Most stroke patients can benefit from referral and remediation for enhancing speech-language and/or cognitive-communication skills
THANK YOU FOR LISTENING

COMMENTS??

QUESTIONS??

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