Mentoring Presentation

Biofeedback Certification International Alliance
Presented by
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Senior Fellow

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First a Cautionary Tale

Never Trust a Presenting Diagnosis
Never Train a Client Based Upon a Diagnosis
Made by Someone Else Unless Carefully and
Thoroughly Done – Including Objective
Physiological Measures

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Diagnosed ADHD
Actually Absence Seizure Activity
Long BP Montage Scale = 350 µV

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3 Per Second Interictal Activity
Long Transverse BP Montage
Scale = 350 µV
Laplacian Montage – Scale = 1400 μA
Might Be Seen in a Single Channel Assessment but Only if Sensor is in the Right Location and Scale is Adequate

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Test Male 1

58 Year Old Male

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Test Male Age 58

- Presenting diagnosis – Adult ADD
  - Planning and execution issues
  - Distractable
  - Task completion issues
- Also
  - Episodic migraine
  - Elevated blood pressure 140-160/80-100
  - Generalized anxiety disorder NOS
  - Wender-Utah score 27
Pre-Training
EC linked ears
Absolute Power

• Note location of 9-10 Hz in central parietal
• Typically seen maximally in occipital
Pre-Training Assessment

- Linked Ears

- Most notable is excess 9-10 Hz in central, temporal and parietal leads

- Also 18-19 Hz excess in parietal
Pre-Training Assessment

- Linked Ears

- 21-22 Hz excess at Cz
**Pre-Training Assessment**

- Slow frontal alpha peak frequency
- Not significant but correlates with memory and cognitive issues

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Pre-Training Assessment

- Laplacian montage
- Excess 9-10 Hz remains
- Bi-lateral excess 1-5 Hz at T5 & T6
- Excess 11-13 Hz in central leads

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Excess Bi-lateral 2-6 & 9-10 Hz
LORETA – Red Areas = >2 SD
Training Protocols

• 2 channel z-score training
  – Fz and Pz – linked ear reference
    • 13 sessions – all channel mean channel plus selected individual channels showing statistical significance
      – To facilitate posterior/anterior communication, frequency regulation (alpha), cognitive integration

  – F3 and F4 – linked ear reference
    • 4 sessions – all channel mean channel plus selected individual channels showing statistical significance
      – To facilitate mood regulation and improve approach/avoidance balance

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Behavioral Changes

• Reported improvements
  – Better focus
  – Able to complete tasks
  – Faster responses to cognitive challenge
  – Better organization
  – Less volatile emotional responses
  – Fewer migraine episodes and reduced intensity

• Remaining unchanged
  – Blood pressure
  – Anxiety
  – Resistance to new experiences/change
  – Continued migraine episodes

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Revised Training Approach

• HRV training in office and as home training protocol - using ‘RESPeRATE’ for BP control
• P3+P4 2 channel sum Alpha/Theta training – 6 sessions
  – Reward 6-8 Hz
  – Inhibit 2-6 Hz
  – Inhibit 13-36 Hz
• P3+P4+Fz+Pz 4 channel synchrony (Douglas Dailey’s ‘TAG-Synch’ with modifications) – 6 sessions
  – 6-8 Hz, 8-12 Hz and 36-44 Hz synchrony
  – Same inhibits

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Second Assessment

- Behavioral changes
  - Continuation of original improvements
  - Reduced BP by 10-15 points in both systolic and diastolic measures
  - Reduced migraine frequency, intensity and duration – from initial 2-3 times/month lasting 1-2 days to 1 time/month or less lasting < 1 day
  - Less anxiety, easier and more relaxed travel to new locations and less need for control
  - Memory and cognitive improvement
Second Assessment EC linked ears
Absolute Power

- Note 9-10 Hz has moved more to posterior/occipital locations
Second Assessment
Resolution of Excess Activity

- Most notable is elimination of excess 9-10 Hz in central, temporal and parietal leads

- Also elimination of 18-19 Hz excess in parietal

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Second Assessment

- Linked Ears

- Elimination of 21-22 Hz excess at Cz
Post-Training Assessment

- More normalized frontal alpha peak frequency
- Not significant but correlates with memory and cognitive improvement
Post-Training Assessment

- Laplacian montage
- Excess 9-10 Hz eliminated
- Bi-lateral excess 1-5 Hz at T5 & T6 eliminated
- Excess 11-13 Hz in central leads also eliminated

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4 Hz Pre and Post

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9 Hz Pre and Post

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Additional Training

• 4 ch z-score training – 5 sessions
  — Fz, Pz, T5, T6
    • To facilitate continued improvement in cognitive skills and improved language functions
Test Female 1

8 Yr Old Female
Test Female 1 – Age 8

- History of behavioral control issues
  - Rages
  - Physical and verbal aggression

- Symptoms include
  - Impulsivity
  - Physical tension
  - Behavior problems
  - Right frontal head injury
  - Problems with sleep

- Significant language issues
  - Slow to talk
  - Expressive and receptive language delays
  - Difficulty with spoken and written language tasks
  - Some evidence of brief stuttering events that may also reflect word finding problems

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Visual Inspection EEG Findings

• 4-5 Hz pattern at the T5 electrode site with a field extending to P3, Pz and O1
• Occurs repeatedly during recording, with voltage up to 180 μV at T5 and 100 μV at Pz in the linked ears montage
• Pattern is present in all montage derivations
• No clear posterior dominant rhythm
• Occasional 7-8 Hz pattern at Pz, P3 and Cz
Slow EC EEG Pattern at T5 – Long BP Montage – Scale = 100 µV
Initial Evaluation 19 ch Absolute Power Topographic Maps – EC LE

- Note left side T5 area of maximal voltage at 4 Hz and at 11-17 Hz
- Note Cz showing maximal activity for 4-17 Hz

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Initial Evaluation 19 ch Absolute Power Z-Scored Topographic Maps – EC LE

- Note left side T5 2-3 SD excess 4 Hz but not 11-17 Hz
- Note Cz-Pz area showing 2-2.5 SD excess 8 Hz

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Initial Evaluation 19
ch Absolute Power Z-Scored Topographic Maps – EC Laplacian Montage

• Note left side T5 2-3 SD excess 4 Hz but not 11-17 Hz
• Note (very small area) Pz showing 2-2.5 SD excess 8 Hz
• Also note 1 Hz excess at T5 and F8
• Possible coup-contra coup injury from right frontal impact injury?

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Training Protocol

• 2 ch z-score training at T5 (near Wernicke's area) combined with Pz, Cz, F7 (near Broca’s area), Fz, F8 and T6
• 21 sessions and re-evaluate
Changes Post Training

- Improvements
  - Improved expressive and receptive language skills
  - Some behavioral improvement
- Remaining issues
  - Continued impulsive and angry outbursts
  - Continued physical aggression
  - Not at grade level for language skills
  - Sleep remains an issue
Repeat Evaluation 19
ch Absolute Power
Topographic Maps –
EC Laplacian Montage

- Note left side T5 area of maximal voltage at 4 Hz and at 11-17 Hz is somewhat reduced but still present
- Note Cz showing maximal activity for 4-17 Hz – also still present with similar distribution

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Repeat Evaluation 19 ch Absolute Power Z-Scored Topographic Maps – EC LE Montage

- Note left side T5 2-3 SD excess 4 Hz is resolved in this montage
- Note remaining Cz excess 8 Hz
- Also note deficient 1-2 Hz in frontal and central leads

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Repeat Evaluation 19
ch Absolute Power Z-
Scored Topographic Maps – EC Laplacian Montage

- Note left side T5 2-3 SD excess 4-5 Hz remains in this montage but is somewhat diminished
- Note (very small area) Cz showing 2-2.5 SD excess 9 Hz and Pz at 8 Hz – also diminished
- Also note 1 Hz excess at T5 and F8 is resolved

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Post Re-Evaluation Protocols

- Home training with AVE device at 6-12 Hz frequencies to facilitate relaxation, general calming and improve sleep
- 4 channel z-score training at T5 and T6 combined with Fz and Pz, with F7 and F8 and with F3 and F4 to continue resolution of language, behavioral and sleep issues
Changes Post Training

- Improvements
  - Improved expressive and receptive language skills to grade level
  - Significant reduction in behavioral outbursts
    - Has begun having friends and has been invited to friends homes
    - Better relationship with siblings
  - Sleeping 9-10 hours per night and waking rested
  - Improved appetite and increased physical activity
  - General mood elevation, less anxious and less depressed
    - Note the last two issues weren’t initially reported
Slow EC EEG Pattern at T5 Resolved
Long BP Montage – Scale = 100 μV
Initial Evaluation Image – Same Scale and Montage as Previous Slide
Slow EC EEG Pattern at T5 Resolved
Long BP Montage – Scale = 50 µV
Linked Ears Montage - Note Posterior Rhythm (Alpha) - Scale = 75 µV
2nd Repeat Evaluation
19 ch Absolute Power
Topographic Maps –
EC LE Montage

- Note left side T5 area of
  maximal voltage at 4 Hz
  and at 11-17 Hz is
  resolved
- Note Cz showing
  maximal activity for 4-
  17 Hz – also resolved
  and beta is more
  appropriately frontal

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2nd Repeat Evaluation
19 ch Absolute Power
Z-Scored Topographic Maps – EC LE Montage

- Note left side T5 2-3 SD excess 4 Hz is resolved in this montage
- Note Cz excess 8 Hz is resolved
- Also note deficient 2-3 Hz in frontal and central leads is diminished and no longer at 1 Hz
Repeat Evaluation 19 ch Absolute Power Z-Scored Topographic Maps – EC Laplacian Montage

- Note left side T5 2-3 SD excess 4-5 Hz is resolved
- Note Cz showing 2-2.5 SD excess 9 Hz and Pz at 8 Hz – also resolved
- Small dot of 1 Hz at Fz