Anatomy & Physiology of Mood Disorders

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AAO Convocation
March 2016
Disclosures

- No Industry Relationships
- American Osteopathic Board of Neurology and Psychiatry, Board Member
- Anatomical images: Thieme Collection
- Convo 2014- Last lecture on Last Day
Objectives

1. Review Mood Disorder criteria and statistics
2. Review Anatomy and Physiology related to current evidence for mood disorders
3. Review literature for manual medicine with mood disorders
Criteria & Stats
DSM 5 Changes

- No longer a single Mood Disorder chapter
- Now Separated:
  - Depressive Disorders
  - Bipolar and Related Disorders
  - Nomenclature changes
Why These Disorders?

- Major Depressive Disorder and Bipolar I Disorder as Prototypes

- Depressive Disorders
  - Major Depressive D/O, Disruptive Mood Dysregulation D/O, Persistent Depressive D/O, Premenstrual Dysphoric D/O, Unspecified Depressive D/O

- Bipolar and Related Disorders
  - Bipolar I D/O, Bipolar II D/O, Cyclothymic D/O, Unspecified Bipolar and Related D/O
Major Depressive D/O

- Depressed mood OR Anhedonia
- 2wks or more
- 5 or more of the following 9:
  - Depressed mood
  - Sleep Changes
  - ↓Interest / Anhedonia
  - Guilty / Worthless
  - ↓Energy
  - ↓Concentration
  - Appetite Changes
  - Psychomotor ↑↓
  - Suicidality

DSM 5
MDD: Statistics

- Lifetime prevalence 16%, 1yr Incidence 8%
- M:F 1:2

Bipolar I Disorder

- Distractibility
- Impulsivity/High risk activities
- Grandiosity
- Flight of ideas
- Increased goal directed activity
- Decreased need for sleep
- Increased talkativeness

Manic Episode Criteria (Required for Bipolar I)

- Euphoric mood: 3 of 7
- Irritable mood: 4 of 7

DSM 5
Bipolar I: Statistics

- Lifetime prevalence 1%, 1yr Incidence 0.6%
- M:F 1:1
- Suicide Lifetime Risk 15x general public
- Episodes: Mania:Depressive - 1:5
Literature Review

Neuroanatomomy & Neurophysiology of Mood Disorders
Caveat & Perspective

- No clear evidence for Etiology in Mood Disorders (Cause / Effect)
- Association at best
HPA & BDNF in MDD

- HPA Axis
  - ↑Cortisol (DST- Sens 64%, Spec 59%)
  - Impaired translocation intracellularly
  - ↓Neuroplasticity

- BDNF
  - ↓BDNF associated with ↓volume
    (Amygdala, Ant Cing Gyrus, Prefrontal Cortex)

GI Microbiota & Brain
“Psychobiotics”

- SCFA-Producing Bacteria: $\rightarrow \downarrow$ Intestinal & BBB permeability $\rightarrow \downarrow$ Bacterial translocation

- Diet $\uparrow$ Saturated Fat/Processed Food $\rightarrow \uparrow$ Intestinal Permeability

- $\uparrow$ Intestinal Permeability $\rightarrow$ Bacterial translocation $\sim$ possible etiology chronic low-grade inflammation

- No studies in Depression, Animal evidence only

Kelly 2015
GI Microbiota & Brain

Kelly 2015
MDD: Findings Vary

- Reduced Frontal Lobe volume
- Reduced Caudate
- Reduced Putamen
- Reduced CBF Anterior Cingulate Gyrus
- Increased CBF Medial Orbital Cortex

- Increased CBF Left Amygdala & Medial Thalamus
- Increased CBF Cerebellar Vermis
- Amygdala-Medial-Thalamus-Ventral-Prefrontal Cortex
- Limbic-Striatal-Pallidal-Thalamic

MDD: Most Evidence

- Hypoperfusion Dorsolateral / Dorsomedial Prefrontal Cortex
- Reduced Frontal Lobe volume
- Hypoperfusion of Anterior Cingulate Gyrus
- Increased CBF Medial Thalamus

- Ventrolateral thalamic nuclei
- Medial thalamic nuclei
- Anterior thalamic nuclei
- Reticular nucleus of thalamus
- External medullary lamina
- Internal medullary lamina
- Mammillary body
Bipolar: Findings Vary

- Bilateral anterior frontal
- Anterior cingulate gyrus
- Left superior temporal
- Bilateral anterior insular
- Third ventricle

- Cerebellar vermis
- Inferior prefrontal
- Amygdala
- Striatum
- Hippocampus

Bipolar: Most Evidence

- Reduced Cerebellar Vermis Volume
- Reduced Right Anterior Cingulate Gyrus Volume
- Decreased CBF and Decreased Left Superior Temporal Cortex Volume
- Reduced Insular Cortex Volume
- Increased Striatum Volume

An Osteopathic Perspective

- Body is a Unit
  - Each element is reciprocally interrelated
  - Are Changes Pathologic or Physiologic
  - Seeking Health in each element
An Osteopathic Perspective

Structure & Function Reciprocally Interrelated

- ↑↓ Perfusion:
  - Vascular tone ~ Fluid dynamics
- Volumetric changes:
  - Pathologic STR ⇔ Pathologic FNX
- Activation level:
  - Pathologic vs Compensatory
An Osteopathic Perspective

- Self-healing & Self-regulatory Systems
  - ↑↓ Perfusion:
    - Physiologic blood dynamics vs Pathology
  - Volumetric changes:
    - Don’t use it you lose it
  - Activation level:
    - Resting strained areas, Conserving resources
An Osteopathic Perspective

- Guiding Discernment
  - Osteopathic Principles as a Lens
  - Trust & Rely on Innate Wisdom of Body Unit
  - Seek Health, Continually
Literature Review

Manual Medicine & Mental Health
Overall

Citations Found

- Massage and Depression: 15
- OMT and Depression: 3
- Spinal manipulation and Depression: 1
- Massage and Bipolar: 1
- Chiropractic and Bipolar: 1
Massage - Depression

- 4 studies: Patient’s with co-morbid condition (OA, CA, HIV, ESRD)- Decreased Depression
- 4 studies: Pregnant women - Mixed results
- 1992 Pilot Study: Inpt Psych C&A- Decreased Depression

Massage - Depression

- Critical Reviews
  - 2002 - Immediate +, Long term No evidence
  - 2004 - Improvement = to psychotherapy
  - 2008 - RCTs did not support efficacy
  - 2013 - Cochrane did not support efficacy

OMT - Depression

- Pilot Study: Adjunctive OMT with Paxil for Depressed Women

- 20-50 y.o. Women, 8wks (weekly sessions)

- Control (9): Cognitive therapy, Neurolinguistic programming, Paxil, OSE

- Treatment (8): Same as control + OMT

- OMS administered, Physician supervised

- No specific OMT protocol (20 min limit)

Plotkin. JAOA. Sep 2001
OMT - Depression

- Pilot Study: Adjunctive OMT with Paxil for Depressed Women
  - Zung Depression Scale
    - Both groups significantly better
    - Control: 30% reached normal range
    - OMT: 100% reached normal range

Plotkin. JAOA. Sep 2001
OMT - Depression

- Quality of life for OMT referrals
  - SF-36 only administered
  - Lower quality of life vs controls
  - Undetermined impact of OMT on QOL

Licciardone. JAOA. Mar 2002
Mood D/O, NZ Osteopaths

- Survey of NZ Osteopaths, 29% response rate (n=62)
- 79% used manual diagnostic tools (TART, CRI)
- 62% agreed osteopathy helps mood d/o clients
- Combo(61%), Cran(53%), Struct(32%), Visceral(16%)
- 50% NZ Osteopaths- no education in Mood d/o

Sampath, IJOM, 2015
Spinal Manipulation - Depression

- Systematic review of RCT for spinal manipulation and psychological outcomes
  - Included osteopathic (2) and others
  - Small significant benefit in first 5 mo vs talking treatment

Williams. Comp Therapies in Med. 2007
Massage - Bipolar

- Review of complimentary and alternative treatment for Bipolar
  - Aromatherapy massage & Massage Therapy “almost entirely lacking” evidence

Chiropractic - Bipolar

- Case Study

- Pole vaulting injury at age 17

- Over next 5 yrs - Bipolar, HA, Seizures, Insomnia

- Cervical subluxation treatment x 1

- No symptoms through 18 mo follow up

Elster. Jrn Manip & Phys There, Mar 2004
Literature Summary

- Most Evidence: Massage Therapy for Depression but mixed
- OMT: Depression Pilot study is the best evidence available
Conclusion

- Association at best for A&P of Mood Disorders
- Pilot study best evidence for OMM
- An osteopath reasons from his knowledge of anatomy - Still
Questions