



Psychological aspects of ADHD in women

Iris Manor

ADHD Unit, Geha MHC, Israel


Sackler School of Medicine, Tel Aviv, Israel



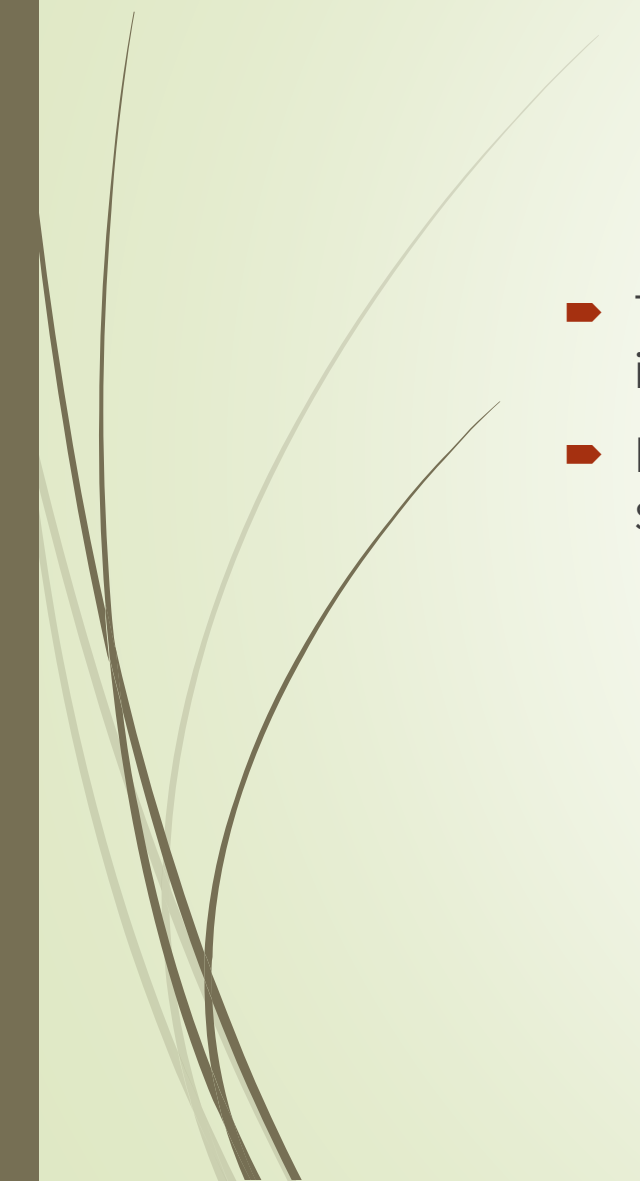
Statement of Potential Conflicts of Interest

Relating to this presentation, the following relationships could be perceived as potential conflict of interests:

I received research support from Alcobra Ltd, participated in advisory boards for Janssen-Cilag Pty Limited and Novartis Pharmaceutical Corporation, and acted as a consultant for Enzymotec Ltd, Janssen-Cilag Pty Limited, Novartis Israel, and Teva Pharmaceuticals Industries, Ltd.

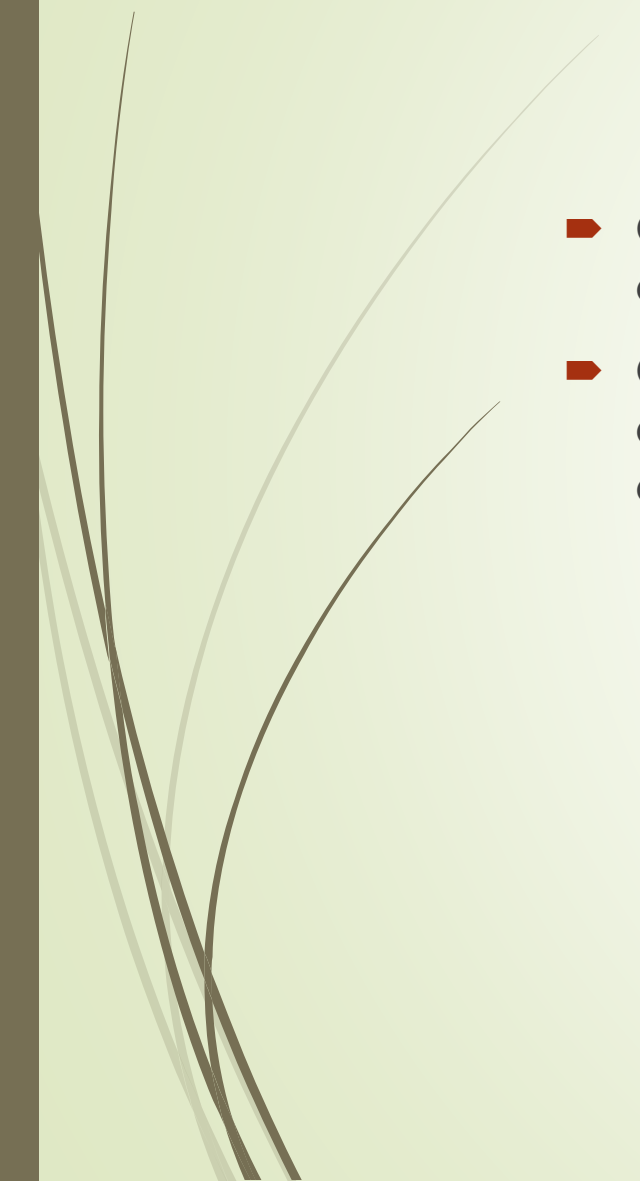


The Gender Difference (women ARE different)

- ▶ The influence of gender difference on the clinical picture is a known factor in medicine at large, and more specifically in psychiatry.
 - ▶ It is found in many disorders and behavioral problems, such as aggression, suicidality, depression and anxiety.
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ADHD and gender difference

- ▶ Gender difference is found in ADHD as well, in which it cuts across the clinical and neuropsychological picture.
 - ▶ Gender seems to be a significant component not only in the clinical outcome, but also in the age of referral for ADHD evaluation, the comorbidity of ADHD, and the response to treatment.
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Neurobiological aspects

- ▶ Sexual differentiation of the brain is a function of various factors, both prenatal and postnatal.
- ▶ These factors are expressed through the release of gonadal steroids, which produce changes in brain excitability and morphology that endure across the lifespan.
- ▶ These changes, and finally the differentiation between the male and the female brain, are achieved by a number of distinct mechanisms across brain regions, such as the making of synaptic connections and circuits organization.
- ▶ These morphological and functional differences are believed to mediate sexually dimorphic behaviors.
- ▶ Two mechanisms of pathology could be suggested:
 1. Brain pathology that interferes, or is synergistic with the gender differentiation
 2. Specific vulnerabilities that are derived from the hormones and the genes that are expressed in one sex versus the other.

Gender as an important factor in executive (dys)functions

- ▶ Balint et al (2008) studied attentional performance in subjects with adult ADHD and its possible relationship with age and gender. They found a significant impairment in complex, focused and sustained attention tasks, whereas only a small measure impairment was found in tests of simple attention tasks.
- ▶ The degree of impairment in the complex tasks varied with gender, with males displaying a higher level of impairment.
- ▶ O'Brien et al (2010), claiming that neuropsychological tests are usually measuring boys, studied the performance within 4 components of EF of girls and boys with ADHD. The tasks involved response preparation, response inhibition, planning and working memory (WM)
- ▶ Compared with controls, children with ADHD showed significant deficits on all EF components. There were no differences between ADHD subtypes on any EF component
- ▶ Comparing boys to girls, similar patterns of dysfunction were found on response preparation and WM
- ▶ However, girls with ADHD showed elevated motor overflow and impairment in planning, while boys with ADHD showed greater impairment during conscious, effortful response inhibition.

Bálint S, Czobor P, Komlósi S, Mészáros A, Simon V, Bitter I. Attention deficit hyperactivity disorder (ADHD): gender- and age-related differences in neurocognition. *Psychol Med*. 2009 Aug;39(8):1337-45.

O'Brien JW, Dowell LR, Mostofsky SH, Denckla MB, Mahone EM. Neuropsychological Profile of Executive Function in Girls with Attention-Deficit/Hyperactivity Disorder. *Arch Clin Neuropsychol*. 2010 Nov;25(7):656-70.



Psychological aspects of ADHD in women

Gender differences seem to be no less significant for the developing self esteem, self perception, and the inner world of adolescents and adults with ADHD

Different ADHD?

- ▶ Girls diagnosed with ADHD have more chance to be diagnosed as predominantly inattentive (PI) than boys (Rucklidge, 2010),
- ▶ They are also less frequently diagnosed as ADHD by the usual scales, but have the same prevalence of ADHD using the empirical examination done in the clinic (Lopez-Soler et al, 2009)
- ▶ Retz-Junginger et al studied the different subtypes of ADHD according to DSM-IV, and did not find any difference between males and females.
- ▶ Monuteaux et al (2010) found no evidence that sex moderated the effect of age on ADHD symptoms
- ▶ Put together, it can be concluded that ADHD symptoms are actually the same in both sexes, but females' ADHD tends to be more hidden.


Rucklidge JJ. Gender differences in attention-deficit/hyperactivity disorder. *Psychiatr Clin North Am.* 2010 Jun;33(2):357-73.

Coles EK, Slavec J, Bernstein M, Baroni E. Exploring the Gender Gap in Referrals for Children With ADHD and Other Disruptive Behavior Disorders. *J Atten Disord.* 2012 Feb;16(2):101-8.

López-Soler C1, Castro Sáez M, Alcántara López M, Fernández Fernández V, López Pina JA. Prevalence and characteristics of externalizing symptoms in childhood. Gender differences *Psicothema.* 2009 Aug;21(3):353-8

Retz-Junginger P, Retz W, Schneider M, Schwitzgebel P, Steinbach E, Hengesch G, Rösler M. [Gender differences in self-descriptions of child psychopathology in attention deficit hyperactivity disorder]. *Nervenarzt.* 2007 Sep;78(9):1046-51

Monuteaux MC, Mick E, Faraone SV, Biederman J The influence of sex on the course and psychiatric correlates of ADHD from childhood to adolescence: A longitudinal study *J Child Psychol Psychiatry.* 2010 Mar;51(3):233-41.



Different referrals – or – a girl must shout aloud

- ▶ Coles et al (2012) examined the impact of the gender of children with ADHD on teachers' perceptions toward their behaviors, and these perceptions' relationship with the teachers' referral recommendations.
- ▶ They found that regardless of gender, teachers overwhelmingly preferred the use of behavior modification instead of referral to professionals.
- ▶ Among the referred group, teachers rated girls as being significantly more impaired and more in need of services than boys.
- ▶ But, children who were described as ADHD PI were rated as being the least impaired, while girls described as HI were rated as being the most impaired.
- ▶ Hence, girls were under-represented in one group and over-represented in the other.

Clinical picture in girls and women

- Babinski et al (Apr 2011) showed that girls with ADHD experienced more difficulties in late adolescence and young adulthood compared to controls.
- They suffered from more conflict with their mothers, had been involved in fewer romantic relationships, and experienced more depressive symptoms.
- On the other hand, some of the same group (Babinski et al, Dec 2011), compared in another study adult women with childhood ADHD (cADHD) to adult women without cADHD and to adult men with cADHD.
- They found again group differences on measures of self-esteem, interpersonal and vocational functioning, as well as substance use.
- But, according to their follow-up tests almost all of these differences were due to diagnostic status, and not to gender.

Babinski DE, Pelham WE Jr, Molina BS, Gnagy EM, Waschbusch DA, Yu J, Maclean MG, Wymbs BT, Sibley MH, Biswas A, Robb JA, Karch KM. Late Adolescent and Young Adult Outcomes of Girls Diagnosed With ADHD in Childhood: An Exploratory Investigation. *J Atten Disord*. 2011 Apr;15(3):204-14.

Babinski DE, Pelham WE Jr, Molina BS, Waschbusch DA, Gnagy EM, Yu J, Sibley MH, Biswas A. Women with Childhood ADHD: Comparisons by Diagnostic Group and Gender. *J Psychopathol Behav Assess*. 2011 Dec;33(4):420-429.

Clinical picture in girls and women

- ▶ Fedele et al (2012) also studied sex differences in college adults with ADHD.
- ▶ College women with ADHD were shown to have higher rates of inattention, hyperactivity, and impairment not only than controls but also than college men with ADHD.
- ▶ The most impaired domains were home life, social life, education, money management, and daily life activities.
- ▶ Merkt & Gawrilow (2014) investigated aspects of health and motivation in college students with ADHD.
- ▶ They found that these students had an impairment in certain functional domains, such as psychological functioning, impaired mental health, and less self-control.
- ▶ They, too, found that the gender differences were significant, since women with ADHD reported worse psychological functioning.
- ▶ Obsessive-compulsive behavior and compensatory efforts were also gender mediated, but they were also mediated by the timing of diagnosis, meaning the tendency of underdiagnosis in girls



Self esteem

- ▶ As was mentioned above, Babinski et al (Apr 2011, Dec 2011) discussed low self-esteem as a characteristic of women with ADHD.
- ▶ Ek et al (2008) analyzed self-esteem in Swede 10-11 yrs. old children with ADHD, including subthreshold ADHD and milder forms of attention disorder with learning disabilities.
- ▶ They found a significant gender difference as girls reported lower self-esteem much more than boys, resulting in lower global self-esteem of the whole ADHD/subthreshold ADHD when compared to controls.
- ▶ The lower self esteem among the girls resulted in lower mental well-being and poorer relationships with parents and peers.



Internalizing and externalizing

- ▶ Rucklidge (2010) compared males and females with ADHD throughout life, and found that they were more similar than different, and generally ADHD profiles were not sex specific.
- ▶ However, females with ADHD suffered more from internalized dysfunctions, such as lower self-efficacy and poorer coping strategies and had higher rates of depression and anxiety.
- ▶ Males tended to show more externalized behaviors, such as physical aggression, being incarcerated and substance abuse (Groß-Lesch et al, 2013)
- ▶ The same findings were presented by Retz-Junginger et al (2007), who described more internalizing problems in females with ADHD and more externalizing behaviour in males with ADHD.


Rucklidge JJ. Gender differences in attention-deficit/hyperactivity disorder. *Psychiatr Clin North Am.* 2010 Jun;33(2):357-73

Retz-Junginger P, Retz W, Schneider M, Schwitzgebel P, Steinbach E, Hengesch G, Rösler M. [Gender differences in self-descriptions of child psychopathology in attention deficit hyperactivity disorder]. *Nervenarzt.* 2007 Sep;78(9):1046-51

Groß-Lesch S, Dempfle A, Reichert S, Jans T, Geissler J, Kittel-Schneider S, Nguyen TT, Reif A, Lesch KP, Jacob CP. Sex- and Subtype-Related Differences in the Comorbidity of Adult ADHDs. *J Atten Disord.* 2013 Nov 6. [Epub ahead of print]



In summary of the clinical picture

- ▶ Girls are prone to be under-diagnosed in the younger age groups
 - ▶ They tend to have a lower self-esteem, lower self-efficacy and poorer coping strategies, as well as worse psychological functioning. They tend to suffer more from depressive episodes and from anxieties
 - ▶ Their compensative mechanisms are bolder, and could be characterized by OCD- like symptoms and effortful way of functioning which causes tiredness.
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Comorbidity – what is common in females with ADHD

- ▶ A greater and significant stability in comorbid psychopathology from childhood into adolescence, compared to males (Monuteaux et al, 2010)
- ▶ As mentioned above, proness to internalizing disorders (Retz-Junginger et al, 2007, Quinn, 2008, Rucklidge, 2010)
- ▶ Anxiety (Quinn, 2008, Groß-Lesch et al, 2013)
- ▶ Depression (Quinn, 2008, Groß-Lesch et al, 2013)
- ▶ Emotional dysregulation (Quinn, 2008, Retz-Junginger et al, 2012)
- ▶ Eating disorders, particularly binge eating and bulimia (Quinn, 2008, Biederman et al, 2007)

Monuteaux MC, Mick E, Faraone SV, Biederman J The influence of sex on the course and psychiatric correlates of ADHD from childhood to adolescence: A longitudinal study *J Child Psychol Psychiatry*. 2010 Mar;51(3):233-41.

Quinn PO. Attention-deficit/hyperactivity disorder and its comorbidities in women and girls: an evolving picture *Curr Psychiatry Rep*. 2008 Oct;10(5):419-23

Retz-Junginger P, Rösler M, Müller R, Retz W Impact of gender on the utilization of outpatient health service for adult ADHD] *Psychiatr Prax*. 2012 Oct;39(7):345-8

Biederman J, Ball SW, Monuteaux MC, Surman CB, Johnson JL, Zeitlin S. Are girls with ADHD at risk for eating disorders? Results from a controlled, five-year prospective study. *J Dev Behav Pediatr*. 2007;28:302-7.

Groß-Lesch S, Dempfle A, Reichert S, Jans T, Geissler J, Kittel-Schneider S, Nguyen TT, Reif A, Lesch KP, Jacob CP. Sex- and Subtype-Related Differences in the Comorbidity of Adult ADHDs. *J Atten Disord*. 2013 Nov 6. [Epub ahead of print]



Comorbidity – the significance of subtypes

- ▶ ADHD subtypes are not a significant factor of comorbidity, with the exception of panic disorder being especially rare in ADHD-PI (Groß-Lesch et al, 2013),
- ▶ Which means, that the comorbidity of adult ADHD is much more sex-dependent than subtype-dependent.

Groß-Lesch S, Dempfle A, Reichert S, Jans T, Geissler J, Kittel-Schneider S, Nguyen TT, Reif A, Lesch KP, Jacob CP. Sex- and Subtype-Related Differences in the Comorbidity of Adult ADHDs .J Atten Disord. 2013 Nov 6. [Epub ahead of print]



In summary

- ▶ The clinical picture tends to be more ADHD-PI
- ▶ Due to earlier social development, the girls' behavior tends to be socially accepted. Hence, even when suffering from combined ADHD they "hide" it
- ▶ The result: Low self-esteem, environmental criticism and incorrect psychological explanations
- ▶ Late diagnosis, wrong diagnosis
- ▶ The whole psychic world is influenced
- ▶ Higher internalized comorbidity
- ▶ Comorbidity is significantly related to gender, not subtype
- ▶ The consequences are seen socially, psychologically, academically and vocationally



Thank you