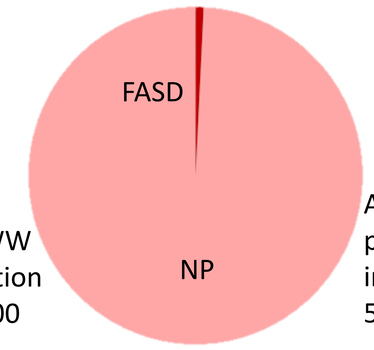
FASD and ADHD: a review on executive functions and treatment

Anne Nájera Pérez de Heredia
Tutorea: Mirari Gaztañaga
Facultad de Psicología UPV/EHU Psikologia Fakultatea

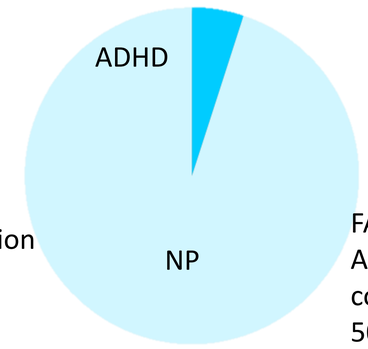
INTRODUCTION

FASD: Encompass the physical and neurobehavioural effects of prenatal alcohol exposure. Prevalence is hard to determine due to high comorbidity rates (Heimdahl, 2020; Lange et al., 2017).

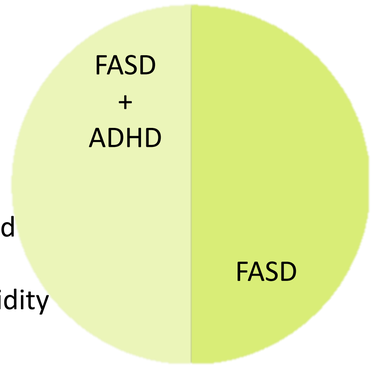
ADHD: Is the most frequent neuropsychiatric disorder in children. Environmental factors play a notorious role, so ADHD and FASD may be related (González Collantes, Rodríguez Sacristán and Sánchez García, 2015).
In fact, **50% of individuals diagnosed with FASD also have ADHD** (Mattson et al., 2019).



FASD WW population 7,7/1000



ADHD population in Spain 5%



FASD and ADHD comorbidity 50%

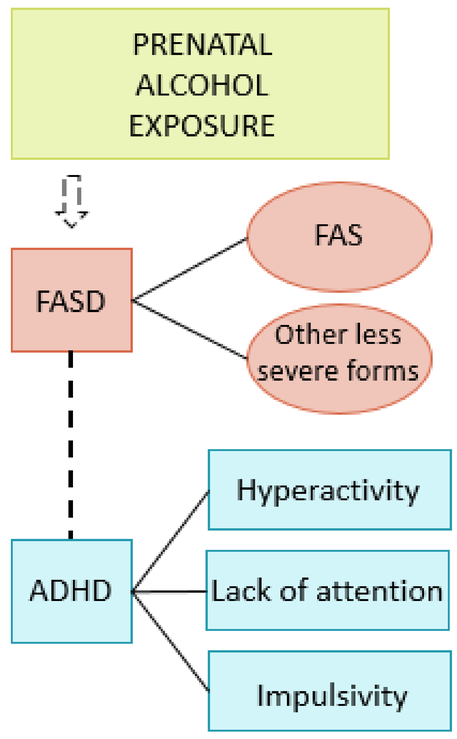
Hypotheses regarding the link (O'Malley and Nanson, 2002):

No etiologic link:

1) The prevalence of ADHD is high independent of the cause
2) ADHD is genetically inherited, although adults with ADHD are more likely to drink

Common cause for FASD and ADHD:

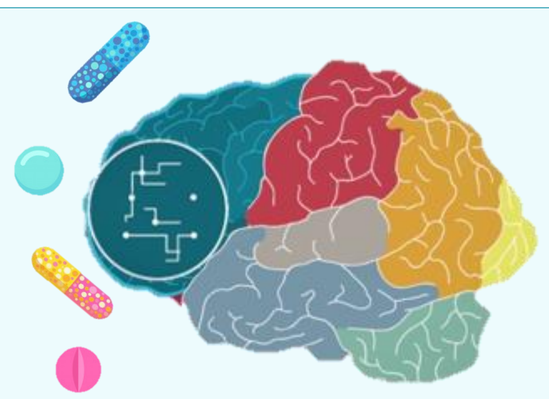
1) Alcohol causes a disregulation on the development of DA and NA systems, which result in ADHD
2) ADHD linked to FASD is a subtype of ADHD with special features



TOPIC DEVELOPMENT

Main FASD-ADHD treatment approach

Clinicians tend to use stimulants to treat inattentive and hyperactive symptoms. Studies show contradictory results about their effectiveness when FASD is involved (Doig, McLennan and Gibbard, 2008; Mela et al., 2020; O'Malley and Nanson, 2002)



Differences between FASD-ADHD and ADHD regarding medication (Mela et al., 2020; O'Maley and Nanson, 2002):

- ADHD tends to have an earlier onset
- Responses to psychostimulants are often worse
- Reaction towards medication is unpredictable
  - Symptoms could turn worse
  - There could be no response towards medication = signal to consider a FASD-ADHD diagnosis

Thus, a pharmacological treatment is not enough

Executive functioning

Individuals with FASD have greater impairments in executive functioning than those with ADHD (Boseck et al., 2015).

Planning	Fluency
Set shifting	Working memory
Response inhibition	Attentional vigilance

No meaningful differences have been found between individuals with FASD and FASD-ADHD (Khoury and Milligan, 2019).

Treatment to improve executive functions

ADHD:

(Caye et al., 2019)

MEDICINES
Allow for making the most of other non –pharmacological therapies

NON-PHARMACOLOGICAL THERAPIES
Allow for a gradual reduction in necessary drug dose

Cognitive training

(Caye et al., 2019; Staff et al., 2021; Tamm et al., 2014)

FASD: Not enough information. Thus, treatment is usually aimed towards the symptoms of the comorbid disorder instead. Interventions that have proven to be useful in ADHD cases have been tried out with FASD. However, they are not always successful (Bagley, 2018).

Dog-assisted therapy (Vidal et al., 2020)

Transcranial direct-current stimulation (Boroda et al., 2020)

Family interventions (Egan et al., 2020; Reid et al., 2017)

Cognitive training

CONCLUSIONS

- The link between FASD and ADHD remains unclear even though a common cause hypothesis stands out due to comorbidity rates, but:
  - Pharmacological intervention used for ADHD does not work the same way when FASD is involved
  - Is the hypothesis of a common cause correct?
- Cognitive training is the main non-pharmacological treatment used to treat executive functions, but there are different opinions:
  - Interventions aimed at improving more than one function at the same time vs. simple tasks with few components
  - Both results may be supplementary
- Dog-assisted therapy, transcranial stimulation and family interventions have proven to be effective, especially when combined with cognitive training.
- There is not enough information available on FASD. Thus, further research is required and psychology plays an important role in this matter.

REFERENCES

Boroda, E., Krueger, A.M., Bansal, P., Schumacher, M.J., Roy, A.V., Boys, C.J., … Wozniak, J.R. (2020). A randomized controlled trial of transcranial direct-current stimulation and cognitive training in children with fetal alcohol spectrum disorder. *Brain Stimulation, 13,* 1059–1068.
Boseck, J.J., Davis, A.S., Cassady, J.C., Holmes Finch, W. and Gelder, B.C. (2015). Cognitive and Adaptive Skill Profile Differences in Children With Attention-Deficit Hyperactivity Disorder With and Without Comorbid Fetal Alcohol Spectrum Disorder. *Applied Neuropsychology: Child, 4*(4), 230–236.
Caye, A., Swanson, J.M., Coghill, D. and Rohde, L.A. (2019). Treatment strategies for ADHD: an evidence-based guide to select optimal treatment. *Molecular Psychology, 24,* 390–408.
Doig, J., McLennan, J.D. and Gibbard, W.B. (2008). Medication Effects on Symptoms of Attention Deficit/Hyperactivity Disorder in Children with Fetal Alcohol Spectrum Disorder. *Journal of Child and Adolescent Psychopharmacology, 18*(4), 365–371.
González Collantes, R., Rodríguez Sacristán, A. and Sánchez García, J. (2015). Epidemiología del TDAH. *Revista Española de Pediatría Clínica e Investigación, 71*(2), 58–61.
Heimdahl, K. (2020). Is it FASD? And does it matter? Swedish perspectives on diagnosing fetal alcohol spectrum disorders. *Drugs: Education, Prevention and Policy.*
Khoury, J.E. and Milligan, K. (2019). Comparing Executive Functioning in Children and Adolescents With Fetal Alcohol Spectrum Disorders and ADHD: A Meta-Analysis. *Journal of Attention Disorders, 23* (14), 1801–1815.
Lange, S., Probst, C., Gmel, G., Rehm, J., Burd, L. and Popova, S. (2017). Global Prevalence of Fetal Alcohol Spectrum Disorder Among Children and Youth: A Systematic Review and Meta-analysis. *JAMA Pediatrics, 171*(10), 948–956.
Mattson, S.N., Bernes, G.A. and Doyle, L.R. (2019). Fetal Alcohol Spectrum Disorders: A review of the neurobehavioral deficits associated with prenatal alcohol exposure. *Alcoholism, clinical and experimental research, 43*(6), 1046–1062.
Mela, M., Hanlon-Dearman, A., Ahmed, A.G., Rich, S.D., Densmore, R., Reid, D., …, Loock, C. (2020). Treatment algorithm for the use of psychopharmacological agents in individuals prenatally exposed to alcohol and/or with diagnosis of fetal alcohol spectrum disorder (FASD). *Journal of Population Therapeutics & Clinical Pharmacology, 27*(3), e1–e13.
O'Malley, K.D. and Nanson, J. (2002). Clinical Implications of a Link Between Fetal Alcohol Spectrum Disorder and Attention-Deficit Hyperactivity Disorder. *The Canadian Journal of Psychiatry, 47*(4), 349–354.
Reid, N., Dawe, S., Harnett, O., Shelton, D., Hutton, L. and O'Callaghan, F. (2017). Feasibility study of a family-focused intervention to improve outcomes for children with FASD. *Research in Developmental Disabilities, 67,* 34–46.
Staff, A.I., van der Hoofdakker, B.J., van der Oord, S., Hornstra, R., Hoekstra, P.J., Twisk, J.W.R., …, Luman, M. (2021). Effectiveness of Specific Techniques in Behavioral Teacher Training for Childhood ADHD: A Randomized Controlled Microtrial. *Journal of Clinical Child & Adolescent Psychology.*
Tamm, L., Nakonezny, P.A. and Hughes, C.W. (2014). An Open Trial of a Metacognitive Executive Function Training for Young Children With ADHD. *Journal of Attention Disorders, 18*(6), 551–559.
Vidal, R., Vidal, L., Ristol, F., Domènec, E., Segú, M., Vico, C., … Ramos-Quiroga, J.A. (2020). Dog-Assisted Therapy for Children and Adolescents With Fetal Alcohol Spectrum Disorders a Randomized Controlled Pilot Study. *Frontiers in Psychology, 11:1080.*