

Gender Dysphoria & Schizophrenia

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Gender dysphoria (GD) & schizophrenia (SCZ):

- **Are neurodevelopmental disorders**
- **Share common brain mechanisms & risk factors:**
 - 1. Alterations in brain development**
 - 2. Alterations in brain sexual differentiation.**

- 1. Comorbidity**
- 2. Alterations in gender identity & gender role & psychological tests**
- 3. Beliefs related to gender change**
- 4. Finger length ratio: 2nd/4th**
- 5. Brain lateralization, handedness, & brain sexual differentiation**
- 6. Brain Derived Neurotrophic Factor - BDNF**
- 7. Attachment & childhood adversity**

1. ****Comorbidity**

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- **Comorbidity of schizophrenia & GD**
- **Greater than would be expected**
- **Patients with either condition**
- **Exhibit symptoms/traits of the other.**

□ In GD:

- **Schizophrenia & schizophrenia-like personality traits**
- **Higher than in general population**
- **In some cases:**
- **Hormonal treatment**
- **Can moderate this association**

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□ In schizophrenia

- **Alterations** may be seen
- In **gender identity & gender role** perception.

● In SCZ, in psychological tests:

- **Inappropriate masculinity-femininity**
- **Disturbed gender role & gender identity**
- **Distortions/omissions of anatomical features**
- **Low satisfaction with body parts in male SCZ**
- **Low scores on masculine role scale**
- **Appropriate scores on feminine role scale**

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□ In schizophrenia

- Numerous case:
- Have **delusional beliefs** about **gender identity**
- Can be **treated** with **antipsychotics**
- **Schizophrenic** symptoms **resolves** with **antipsychotics**

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- **Schizophrenic symptoms resolves with antipsychotics**
 - **But GD persists**
 - **→ GD is not delusional believes!**

- **Some patients does not fit into either category.**
- **A grey area between**
- **Schizophrenia**
- **& GD**



- **GD** is due to a disorder of sexual development (**DSD**):

1. Which **specifically** involves the **brain**

2. But **sparing** the internal/external **genitalia**

- **Frontal-limbic-temporal-parietal neural network**
- Mediate:
 1. **Body image**
 2. **Body concept**

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- **Gender-atypical brain development**
 - May be caused by
 - Prenatal **hormonal imbalances**



□ In both SCZ & GD:

- 1. Altered cerebral sexual dimorphism**
- 2. Changes in cerebral lateralization**

□ In GD:

- Sexually brain regions
- Resemble the desired gender
- Not the anatomical gender!

□ In schizophrenia:

- Similar variation in some structures:

1. **Men** showing a “**feminized**” pattern
2. **Women** showing a “**masculinized**” pattern

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- **Ratio of length of 2nd & 4th digit**
- **Higher ratios → “feminized” pattern.**
- **In GD:**
- **Altered 2nd D/4th D ratio**
- **In direction of self-identified sex**

- Male to-female subjects:
 - More “**feminized**” pattern *than control subjects*
- Female-to-male subjects:
 - More “**masculinized**” pattern *than control subjects*
- **May** be linked to **abnormal** prenatal **testosterone** exposure

- In schizophrenia / schizotypal disorder :
- Similar alterations in the **2D: 4D** ratio
- Specifically in **males**
- **May** be linked to **abnormal** prenatal **testosterone** exposure

(Schizophrenia & schizotypal dis. are genetically & clinically related)

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□ In Both SCZ & GD:

- 1. Altered cerebral sexual dimorphism**
- 2. Changes in cerebral lateralization**

□ Both SCZ & GD:

Have **alterations** in cerebral **lateralization**

- → Excess of **atypical handedness**
- **Higher left-handedness/mixed laterality**
- *Than general population*

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□ Brain derived neurotrophic factor (BDNF)

- A nerve **growth factor**
- **Key role in brain development & plasticity**
- Activity of BDNF:
- Can be **influenced** by
- **Sex hormones** such as **estrogen & testosterone**

□ Both schizophrenia & GD:

- A decrease in serum BDNF level
- *Compared to healthy controls*

□ Low BDNF levels

- Cause **defect / deviation**
- In **brain development**
- Including **sexual differentiation** of the brain

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□ Disturbances in attachment, severe adversity & maltreatment:

- 1. Greater risk of schizophrenia**
- 2. Greater body dissatisfaction**
- 3. Worse mental health**

□ Mechanisms may be:

- **Release of stress hormones**
- **Lower BDNF levels**
- **Can affects childhood brain development**
- **Can distort brain representations of self & others**

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- **SCZ & GD**
 - **Share** certain causal pathways
 - But **do not** overlap **completely**.

□ Differences between SCZ & GD:

- 1. **Thickness of cerebral cortex**
- 2. Intensity of changes**
- 3. Cross gender behavior**
- 4. Birth order**
- 5. Other risk factors**
- 6. Treatment**

❑ Thickness of cerebral cortex

- Schizophrenia:
- **Decreased cortical thickness** in both genders
- Male-to-female GD:
- **Increased cortical thickness**

□ Differences between SCZ & GD

- Thickness of cerebral cortex
- ****Intensity of changes**
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□ Brain changes in GD:

1. **Less severe**
2. **More region-specific**
 - *Than in schizophrenia.*

□ Differences between SCZ & GD

- Thickness of cerebral cortex
- Intensity of changes
- **Cross gender behavior
- Birth order
- Other risk factors
- Treatment

❑ Cross gender behavior:

1. **Early childhood cross-gender** behavior
 2. **Same-sex** sexual fantasies
- *Not associated within schizophrenia.*

□ Differences between SCZ & GD

- Thickness of cerebral cortex
- Intensity of changes
- Cross gender behavior
- **Birth order
- Other risk factors
- Treatment

□ Birth order:

- **Schizophrenia: earlier birth order in males**
- **Male-to-female GD: later birth order**

□ Differences between SCZ & GD

- Thickness of cerebral cortex
- Intensity of changes
- Cross gender behavior
- Birth order
- ****Other risk factors**
- Treatment

❑ Other risk factors:

- Migration, urbanicity, obstetric complications, cannabis use, maternal viral infection
- Are specific to **schizophrenia**
- Not GD!

□ Differences between SCZ & GD

- Thickness of cerebral cortex
- Intensity of changes
- Cross gender behavior
- Birth order
- Other risk factors
- **Treatment



- **Important:**

- GD is **not** a psychotic disorder

- **Wish** for **gender change** is **not** a schizophrenic thought disorder

- GD individuals **must not** be treated with **antipsychotic** medication!

- **SCZ & GD**
- **Share** certain causal pathways
- But **do not** overlap **completely**.

□ Conclusion

- **Gender dysphoria & schizophrenia**
- **Are neurodevelopmental disorders**
- **Have common causal mechanisms**
- **& common risk factors**

□ Conclusion

- **Further** investigations
- May provide **new perspectives in:**
 1. **GD & schizophrenia**
 2. **Brain development**
 3. **Brain sexual differentiation.**

