Myxedema:
a rapidly cured psychosis in the setting of bipolar disorder

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Introduction

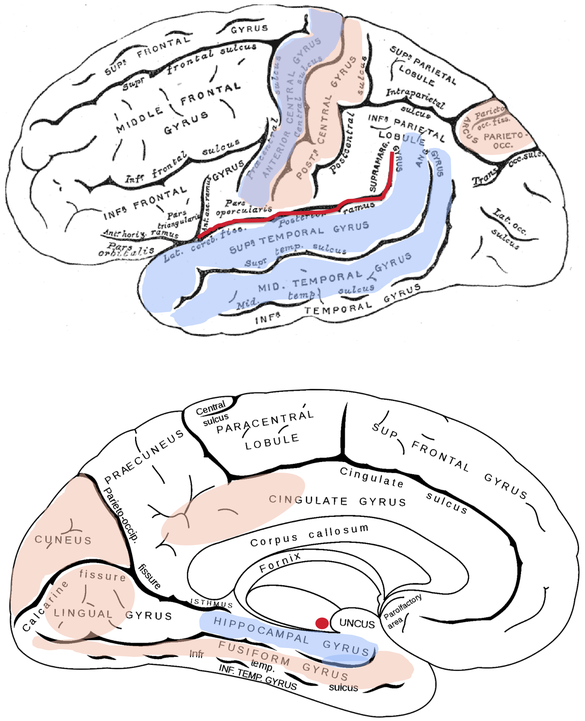
- We herein present a case of a 51 year old female with a longstanding history of bipolar disorder who presented twice to the emergency department for new auditory hallucinations.
- Multiple brain centers are implicated in auditory hallucinations, primarily studied in those with schizophrenia and notably with hyperactivation of these centers.
- Interestingly, hypothyroidism is associated with global cerebral hypoperfusion, making primary auditory center activation a less likely pathology in this case.
- Myxedema coma is the most prevalent presentation of clinically severe hypothyroidism, but hallucinations can also be the primary manifestation.

Case Presentation

- A 51-year-old female with bipolar II disorder, hypothyroidism and migraines presented twice to the emergency department for new onset auditory hallucinations, increasing in volume for one month.
- On initial presentation, she was treated with a refill of her lurasidone as she expressed noncompliance.
- Upon returning to the ED, exam revealed bradycardia, symmetric 3+ strength and 1+ reflexes, cognitive slowing and clear response to internal stimuli.
- TSH = 91.27, free T4 = 0.53, urine toxicity screen was negative and head CT was within normal limits.
- Further questioning revealed a depressive episode preceded the hallucinations, leading to disorientation to time and the patient taking her medications inconsistently or not at all most days.
- Her lurasidone was switched to risperidone for better psychotic feature control and intravenous levothyroxine 100mcg was administered on admission to treat severe hypothyroidism.
- She rapidly improved, with softening of the auditory hallucinations, normalization of heart rate and increasing cognitive ability and was discharged on day 3 with oral levothyroxine in place of her desiccated thyroid extract.

Figures

Auditory Centers of the Brain



Figures 1 & 2. Brain centers effected by hypothyroidism and auditory hallucinations.
Figure 1 *lateral view of the cerebellum.*
Figure 2 *lateral cross section of the cerebellum.*
Orange: areas of hypoperfusion as seen in hypothyroidism (not pictured: insula).
Blue: areas of activation in auditory hallucinations as studied in schizophrenia (not pictured: posterior insula).
Red: traditional auditory centers: Heschl's gyrus and the medial geniculates of the thalamus.
Purple: overlap between hypothyroidism and auditory hallucinations

Discussion

- This case describes a difficult clinical diagnosis between a psychiatric and metabolic cause of psychosis in a clinically depressed patient. Ultimately her hallucinations resolved with thyroid hormone supplementation, confirming the diagnosis of hypothyroid psychosis.
- Auditory hallucinations (**figure 1 & 2**) have primarily been studied in patients with schizophrenia, identifying hyperactivity in the right superior and middle temporal gyri, posterior insula, precentral gyrus, hippocampus and parahippocampal gyrus.[1]
- Hypothyroidism is associated with decreased cerebral blood flow (**figure 1 & 2**) to the right parieto-occipital, posterior cingulate, lingual, fusiform, precentral and postcentral gyri, the cuneus and insula.[2]
- Heschl's gyrus and the medial geniculates of the thalamus (**figure 1 & 2**) have not been shown to be activated in auditory hallucinations as one may intuitively think. [2]
- Increased activity in the precentral gyrus (**figure 1 & 2**) has been observed with auditory hallucinations but does not align with the decreased blood flow observed in those experiencing hypothyroidism. [3]
- This patient's hallucinations were initially thought attributed to her bipolar disorder given the preceding depressive episode, but as she had been unable to take her exogenous thyroid hormone and her significantly elevated TSH, her hallucinations were best explained by severe hypothyroidism.

Conclusions

- Thyroid dysregulation should be considered in any patient presenting with altered sensorium.
- Hypothyroid psychosis is quickly and easily reversible with exogenous hormone supplementation.
- It is likely in the hypothyroid, hypoperfused brain, vivid memories emerge to bridge gaps in perceived reality, which can manifest as auditory hallucinations.[4]

References

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