

# Recurrent Ischemic Strokes with Methylene tetrahydrofolate Reductase Homozygosity, a Coincidence or Consequence?

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## Background

- Ischemic strokes are a leading cause of death and disability in the developed world
- Effective prevention is an important strategy to reduce the overall burden of stroke
- Methylene tetrahydrofolate reductase (MTHFR) involved in folate metabolism catalyzes the formation of 5-methyltetrahydrofolate, which is the main circulatory form of folate
- Mutation in the MTHFR gene is associated with hyperhomocysteinemia, which increases risk for venous thrombosis, vascular diseases and thus stroke

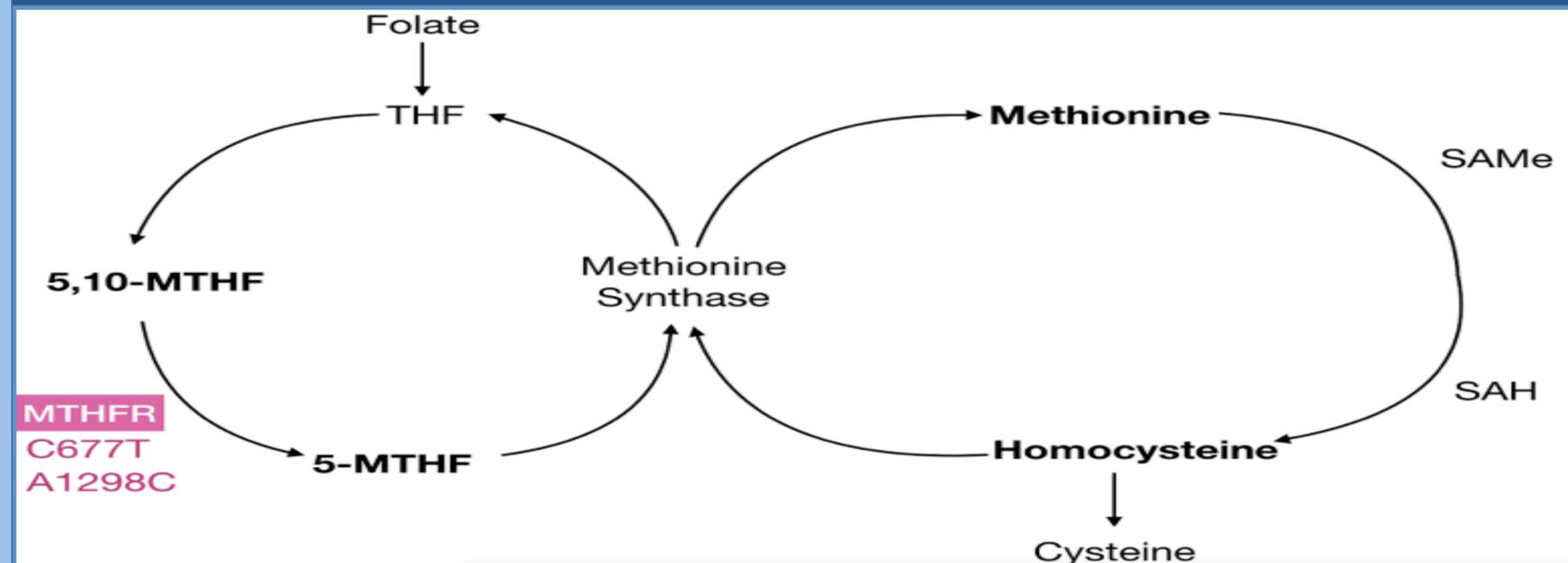
## Case description

- A 51 year old male with a past medical history of Diabetes, Hypertension, and MTHFR homozygosity with a prior history of multiple ischemic strokes presented with slurred speech, right sided facial droop, and left arm weakness for 4 days.
- His symptoms initially improved, but then worsened in severity which resulted in a presentation of the patient to the emergency department. An MRI of the brain identified an acute pontine stroke.

## Discussion

- A common polymorphism in the gene encoding the *MTHFR* enzyme, which converts dietary folate to its active cofactor in homocysteine catabolism has been studied as a genetic risk factor for stroke
- As T allele dose increases, this polymorphism causes a graded elevation in total homocysteine, which is most pronounced in individuals with low dietary folate consumption
- Laboratory and clinical studies have indicated that elevated total homocysteine may promote atherosclerosis and cause endothelial dysfunction resulting in a possible association with total homocysteine and strokes.
- Dietary folic acid intake inhibits the influence of the *MTHFR* substitution on plasma homocysteine, by facilitating homocysteine remethylation to methionine.

## Images



## Conclusion

- Folate supplementation may have a benefit among homozygotes or heterozygotes, or in populations where the prevalence of a certain genotype is high.
- Our patient received guideline directed medical therapy for secondary stroke prevention. However, a consideration for patients with this genetic polymorphism is that they may benefit from folate supplementation in addition to the usual secondary stroke prevention medications.
- This association may have to be studied further.

## References

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