INTRODUCTION

Post-translational histone modifications (PTM), such as methylation of lysine residues on histone H3, regulate gene expression patterns. The role of DNA methylation in regulating PTMs has been explored in several studies [1]. However, the relationship between DNA methylation and PTMs in the context of nutritional interventions is not well understood. This study aimed to investigate the interaction between nutritional factors and PTMs in leukocytes.

METHODS

This was a randomized, placebo-controlled trial (FACT) in which participants received a methyl donor supplement (FA) or placebo for 12 weeks. Blood samples were collected at baseline and after the intervention. Leukocyte DNA methylation and histone modifications were measured using DNA microarray and western blotting, respectively.

RESULTS

In this study, we observed a significant increase in %H3K36me3 in men with higher plasma choline (P = 0.05). There was also a trend for increased %H3K36me2 with higher plasma choline and lower plasma homocysteine (P = 0.05). These findings suggest that dietary factors, such as choline, may influence histone modifications, potentially affecting gene expression.

SUMMARY

The Folic Acid and Creatine Trial (FACT) showed that a methyl donor supplement increased %H3K36me3 in men, with a trend for increased %H3K36me2. These results highlight the potential role of diet in modulating histone modifications and gene expression.

CONCLUSIONS

The results of this study provide evidence for the interplay between nutrition and histone modifications, suggesting that targeted nutritional interventions may lead to changes in gene expression. Further research is needed to elucidate the mechanisms underlying these observations.

REFERENCES


