Study of the Genotoxicity Potential of Creatine Monohydrate Using Human Osteosarcoma Cells

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ABSTRACT

Creatine monohydrate is widely used to enhance athletic performance, though concerns exist about potential carcinogenic effects. This study assessed its cyto- and genotoxic effects in U2OS cells.
Trypan Blue assay showed >98% cell viability, indicating no cytotoxicity while γH2AX immunofluorescence revealed no DNA damage at 1-10 mM.
γH2AX levels decreased with increasing creatine concentration, suggesting a potential genoprotective effect, with lowest damage at 7 mM. Further research is needed to confirm these findings.

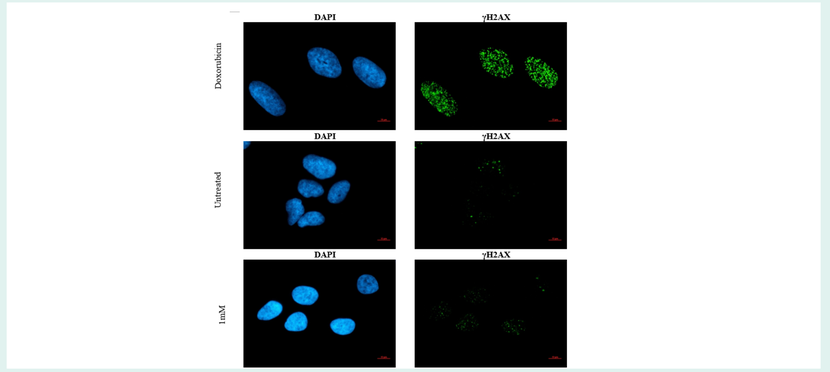
AIM

To assess the cytotoxic and genotoxic effects of Creatine Monohydrate on U2OS cells, and explore its potential as a protective agent against DNA damage.

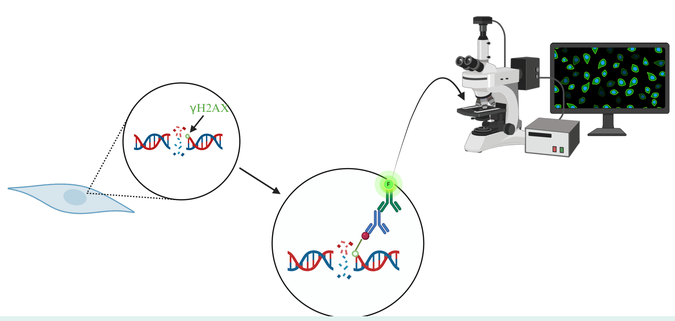
METHODS

- Cell Line: U2OS (Human Osteosarcoma Cells)
- Treatment: Creatine Monohydrate at 1mM, 2mM, 7mM, and 10mM
- Cytotoxicity Assay: Trypan Blue (cell viability)
- GenotoxicityAssay: γH2AX Immunofluorescence
- Analysis: Quantification of γH2AX foci

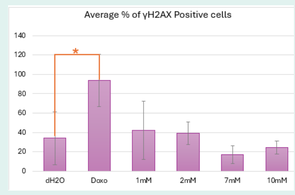
RESULTS



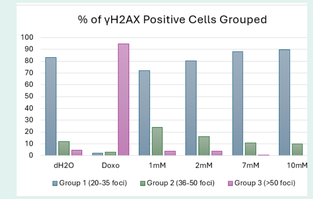
Representative images of the samples



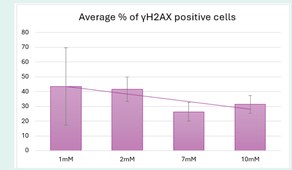
Visual representation of indirect immunofluorescence



Average percentage of γH2AX positive cells after treatment with different concentrations of creatine monohydrate. Cells were also treated with dH2O as a negative control and with Doxorubicin (Doxo) as a positive control.



The average % of γH2AX positive cells in all experiments, grouped.



Average percentage of γH2AX positive, creatine monohydrate treated cells

CONCLUSIONS

. The results confirmed the hypothesis that creatine monohydrate does not cause damage to the cells or the DNA. In fact, the results indicated a possible DNA-protecting effect that CMH exerted on the cells, especially at 7mM concentration. When compared to the negative control, the highest studied concentrations did not prove to be statistically significant, but replication and further studies are needed for a confident conclusion regarding CMH's genoprotective role.

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