DIETARY CHOLINE WITH DHA PROVIDES BETTER NEURO-PROTECTION AGAINST GESTATIONAL STRESS-INDUCED NEURO-COGNITIVE DEVELOPMENTAL DEFICITS IN RAT OFFSPRING

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INTRODUCTION

○ Gestational stress causes behavioral alterations in offspring that persists into adulthood.
○ Choline and DHA are essential nutrients important for structural integrity and signaling functions.
○ Choline is used in the synthesis of phosphatidylcholine.
○ DHA is a polyunsaturated fatty acid, highly enriched in cell membranes of the brain.
○ There are no studies showing the neuroprotective efficacy of dietary choline with DHA during gestation on neurocognitive developmental outcome in their offspring.

OBJECTIVE

The aim of this study was to assess neurocognitive outcomes in rat pups born to stressed dams supplemented with choline or DHA or both during the gestational period.

MATERIALS AND METHODS

ED DAY PREGNANT DAMS

<table>
<thead>
<tr>
<th>Normal control (NC)</th>
<th>Saline control (NC)</th>
<th>Stress (STR)</th>
<th>Stress+ Choline (STR+C)</th>
<th>Stress+ DHA (STR+DHA)</th>
<th>Stress+ Choline+DHA (STR+C+DHA)</th>
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<tbody>
<tr>
<td>Undisturbed in their home cage (n=10/group)</td>
<td>Saline supplementation of saline E0 to delivery (n=10/group)</td>
<td>Stress E11 to delivery (n=10/group)</td>
<td>Stress E11 to delivery, Choline E0 to delivery (n=10/group)</td>
<td>Stress E11 to delivery, DHA E0 to delivery (n=10/group)</td>
<td>Stress E11 to delivery, Choline E0 to delivery, DHA E0 to delivery (n=10/group)</td>
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Behavioural tests - Postnatal day 35-45 (n=10/group) Spatial learning (T-maze Test) | (Spontaneous Alternation, Rewarded Alternation) | Passive avoidance Test

RESULTS

CONCLUSIONS

○ Results show significant behavioral deficits in rat pups from dams subjected to restraint stress as compared to the same in age-matched normal controls.
○ These behavioral deficits were found to be significantly attenuated in rat pups from stressed dams orally supplemented with choline and DHA as compared to those in STR group in T Maze and passive avoidance test.
○ Choline and DHA provide better neuro-protection against gestational stress-induced neuro-cognitive developmental deficits in rat offspring.

REFERENCES