INTRODUCTION

The neonatal period, the first 30 days of life, involves rapid development in temperament and sensory responsiveness. Temperament is innate individual differences in self-regulation, activity level, sociability, and reactivity. Sensory responsiveness is the way an individual processes sensory input. This may manifest as over- or under-reaction to a stimulus. Temperament and sensory responsiveness both potentially affect the acquisition of each other. In addition, the development of these traits may be impacted by factors, such as sex, stress, and a polymorphism of the mu opioid receptor (OPRM1), a receptor involved in reducing pain when activated. Focusing on factors that impact temperament and sensory responsiveness development during the neonatal period may offer insight on the arrangement of neural networks that make up behavioral and sensory systems. Aberrant sensitivity and temperament characterize symptomology of certain human disorders that involve the central nervous system, such as Autism Spectrum Disorder (ASD)

Purpose

• Investigate neonatal development by identifying the relationships between temperament and sensory responsiveness.
• Examine how individual attributes, such as sex, stress, and presence of the OPRM1 gene in the μ-opioid receptor, influence development of temperament and sensory responsiveness.

METHODS

Subjects

• 24 neonatal rhesus macaques, 12 males and 12 females

Measures & Procedures

• Primate Neonatal Neurobehavioral Assessment (PNNA) was administered four times to assess the development of temperament and sensory responsiveness.

Table 1. Definition of Items on the PNNA

<table>
<thead>
<tr>
<th>Cluster</th>
<th>Item</th>
<th>Definition</th>
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<tbody>
<tr>
<td>Temperament</td>
<td>Intraobserver</td>
<td>Amount of vocal and motor distress noted during the entire examination.</td>
</tr>
<tr>
<td>Sensory Response</td>
<td>Palpation</td>
<td>Ability to hold hand up while holding hand.</td>
</tr>
<tr>
<td></td>
<td>Prone</td>
<td>Prone Response to tactile stimuli to four extremities.</td>
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<tr>
<td></td>
<td>Rotational Test</td>
<td>Degree to which hand and/or eyes turn in the direction of rotation, both head free and restrained.</td>
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Table 2. Correlations between the Five Variables

<table>
<thead>
<tr>
<th>Temperament</th>
<th>Sensory Resonse</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.175</td>
<td>0.075</td>
</tr>
<tr>
<td>0.115</td>
<td>-0.146</td>
</tr>
<tr>
<td>-0.187</td>
<td>-0.119</td>
</tr>
</tbody>
</table>

RESULTS

Figure 1. Frequency Distribution of Temperament Scores

Figure 2. Frequency Distribution of Sensory Responsiveness Scores

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CONCLUSIONS

• Results did not support a strong relationship between temperament and sensory responsiveness during the neonatal period.
• Subjects that were male, had the polymorphism on the OPRM1 gene, and had high stress tended to be associated with a more abnormal temperament and sensory responsiveness score.
• Several potentially confounding variables were uncontrolled in this study due to the fact the data was obtained from an on-going study. Therefore, future research using naïve subjects is needed to determine whether the relationships investigated in this study are stronger.

IMPLICATIONS FOR PRACTICE

• Researchers have found a distinct relationship between temperament and sensory responsiveness in humans. If this association is identified and found to be significant during the first few years of life or even infancy, we can better diagnose these children.
• Occupational therapy has been identified as the most effective treatment for children with Autism Spectrum disorder (ASD) by parents. Emerging research has identified that the crucial element to OT’s effectiveness is early intervention.
• In order to receive these services early on a child must be diagnosed with ASD or at the very least show developmental abnormalities that are similar to ASD symptoms. Early detection of ASD is getting better, but there are still children going undiagnosed.

ACKNOWLEDGEMENTS

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REFERENCES
