Autonomic Nervous System Functioning and Internalizing Disorders in Adolescents

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INTRODUCTION

- The autonomic nervous system (ANS) is used to describe the sympathetic (activation) and parasympathetic (inhibition) nervous system.
- Heart rate (HR) and blood pressure (BP) resting level or reactivity reflect ANS functioning.
- Imbalance of the ANS is associated with negative cardiac health events, cardiovascular disease, and death.
- The purpose of the study is to consider the developing nervous system in internalizing adolescents since changes taking place now could predispose them to future health risks, and to find if these ANS patterns differ for males and females.

METHODS

Population
- 215 healthy, internalizing, or comorbid adolescents from a larger, longitudinal study at NIMH.
  - Internalizing: Depression, anxiety, etc.
  - Comorbid: Internalizing and externalizing combined.
  - Externalizing: Aggression, hostility, etc.
- Age 11-16, average was 13.67 years ($SD = 1.80$).
- Inclusion criteria: screen for emotional and behavior problems (internalizing and externalizing symptoms).
- Youth Self-Report (YSR) and Child Behavior Checklist (CBCL) to measure symptomatology (Achenbach, 1991).

Procedure
- Two social stressors: conversation and speech task.
- Average HR and BP (includes SBP, DBP, and MAP) resting level and reactivity measured.
  - SBP: Highest arterial blood pressure after left ventricle contraction during a cardiac cycle.
  - DBP: Lowest arterial blood pressure during filling of the heart in a cardiac cycle.
  - MAP: Average arterial blood pressure during a cardiac cycle.
- Physiological data taken throughout Social Performance Paradigm (SPP); pre-task (baseline), post-SPP-C (post-conv), post-SPP-S (post-speech).
- Critikon Dinamap Vital Signs Monitor (1846 SX) used to measure HR/BP.

RESULTS

- Females had a higher mean post-SPP-C HR compared to males ($p < .05$).
- Males had higher mean SBP before and after each stress task ($p < .01$; $p < .05$).
- 11-12 year-olds showed higher mean HR overall ($p < .001$) but not reactivity.

- Severity of problems was weakly associated with HR (pre-task: $r = .151$, $p < .05$; post-SPP-C: $r = .163$, $p < .05$; post-SPP-S: $r = .171$, $p < .05$), post-SPP-C DBP ($r = .136$, $p < .05$), and post-SPP-C MAP ($r = .143$, $p < .05$).
- Current anxious mood not related to HR/BP.

CONCLUSIONS

- The aim of the study was to consider ANS functioning in male and female adolescents who were exhibiting a range of internalizing problems.
- Differences in ANS functioning in at-risk youth compared to healthy controls were documented in adolescent males.
- Emerging differences in ANS functioning in adolescents could have important implications for future health and may explain current trends.

Limitations and Future Research

Among the limitations of the study was an inability to differentiate between anxiety and depression, etc. Future research clarifying the role ANS functioning has in mediating cardiac problems among internalizing youth would further carve the path in developing preventive interventions, thereby potentially decreasing future cardiac-related health risks.

REFERENCES


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