INTRODUCTION

- Traumatic brain injuries (TBI) are a common result from vehicle crashes, accounting for 33% of all injury-related deaths.
- Brain material properties alter as post mortem time progresses.
- Sodium bicarbonate has been used clinically to minimize the increase in pH ions, but has not been used previously for post mortem testing.
- Brain material properties alter as post mortem time progresses.

MATERIALS & METHODS

A Post Mortem Human Subject (PMHS) was used in this study. The PMHS died of pneumonia, was 67 years of age, and was acquired 32 hours post mortem.

- The whole brain was removed from the cranial cavity with no dura mater or brainstem attached.
- Specimens were cut from the Frontal, Parietal, and Occipital lobes using a 5/8” cylindrical cutting die (Figure 1).
- Each specimen was trimmed to 25 mm (Figure 2) and then placed in one of four artificial cerebrospinal fluid solutions (aCSF) (Figure 3).

RESULTS & DISCUSSION

- For the parietal lobe, the stiffness values of specimen soaked in sodium bicarbonate or both antibiotics and sodium bicarbonate were closest to the baseline specimen tested immediately after harvest.
- For the frontal lobe, the stiffness values of specimens soaked in both antibiotics and sodium bicarbonate were closest to the baseline specimen tested immediately after harvest.
- Figure 8 shows that little degradation was visible after 24 hours of storage (56 hours post mortem) but the specimens soaked in both antibiotics and sodium bicarbonate solutions showed substantially less degradation than the other specimens after an additional 24 hours (80 hours post mortem).

CONCLUSIONS

- Sodium bicarbonate can be utilized as a tool to help slow down brain tissue degradation.
- The combination of sodium bicarbonate and antibiotics solution along with just the sodium bicarbonate solution both showed potential to be able to minimize the effects on brain tissue stiffness as post mortem time progresses.
- Future work exploring the effects of antibiotics and sodium bicarbonate on brain motion in post mortem whole-head testing.

REFERENCES CITED

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DEVELOPING A METHOD OF SLOWING TISSUE DEGRADATION THROUGH TEMPERATURE, SODIUM BICARBONATE AND ANTIBIOTICS FOR TRAUMATIC BRAIN INJURY TESTING

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