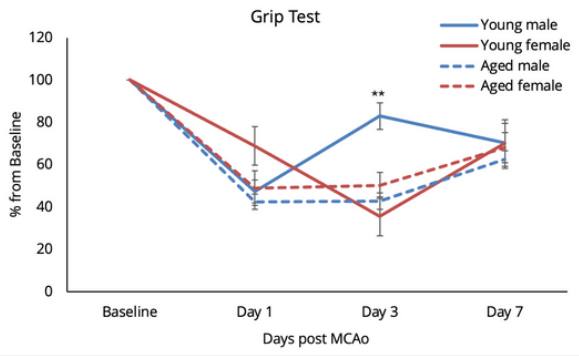
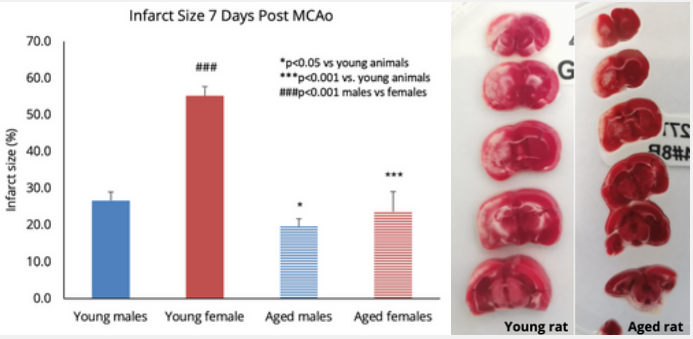
ENHANCING STROKE MODELS WITH DIVERSITY: THE IMPACT OF AGE, SEX, AND COMORBIDITIES

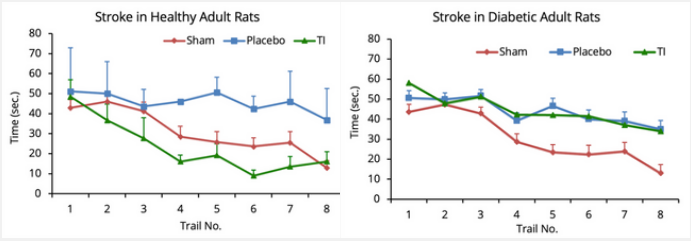
RESULTS



Grip test in MCAo rats. Strength performance in MCAo rats varies by age and sex throughout the study. Young males recover faster than other groups.



Infarct sizes measured in MCAo rats. Young female MCAo rats exhibit larger infarct sizes than young males, aged males, and aged females.



Morris Water Maze assay in 4VO rats. 4VO-operated rats struggled to locate the hidden platform (blue) compared to non-ischemic controls (red). In young, healthy rats, the test item showed a beneficial effect (green, left), but no such benefit was observed under diabetic conditions (green, right).

OBJECTIVES

Stroke predominantly affects older populations with a range of comorbidities such as diabetes, hypertension, and cardiovascular disease. These individuals are oftentimes on medications to manage these conditions. However, preclinical stroke research predominantly relies on young, healthy, male rodents. This gap between clinical reality and preclinical models makes it challenging to translate findings into effective therapies. MD Biosciences has validated stroke models to more accurately reflect clinical scenario by incorporating diversity in models.

PRECLINICAL MODEL

MCAo focal ischemia rat model: Occlusion of the middle cerebral artery leads to a reduction of cerebral blood flow in both the striatum and the cortex.

4VO global ischemia rat model: Permanent occlusion of vertebral arteries and transient occlusion of carotid arteries leads to a reduction of cerebral blood flow.

CONCLUSIONS

Incorporating age, sex, and comorbidity diversity in preclinical stroke models enhances clinical relevance. The larger infarct sizes and slower recovery observed in aged and female MCAo rats highlight the need for models that reflect patient variability. Cognitive deficits in diabetic 4VO rats further emphasize the role of comorbidities in stroke outcomes.