IMPACTS OF MITOQUINOL MESYLATE INTAKE ON VASCULAR FUNCTION AND COGNITIVE IMPAIRMENT IN PATIENTS WITH MILD COGNITIVE IMPAIRMENT: A CASE STUDY

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BACKGROUND

• Mild cognitive impairment (MCI) is a decline in cognitive function to a greater extent than the natural aging process, affecting memory, communication, and overall quality of life
•Reduced brain blood flow is strongly associated with reduced cognitive function and neurodegenerative diseases, of which is partially attributed to excessive reactive oxygen species (ROS) production
•Previous studies have shown that mitoquinol mesylate, a mitochondrial-targeted antioxidant, can improve endothelial function and can scavenge ROS in healthy older adults, however the impacts of mitoquinol mesylate intake on vascular function in patients with MCI have not been investigated

PURPOSE

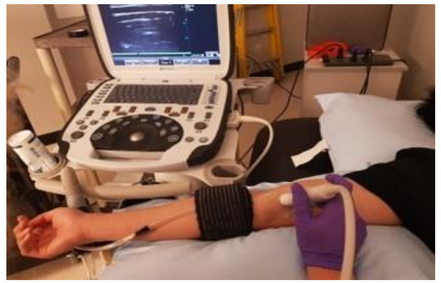
•To examine the impacts of acute mitoquinol mesylate intake on heart rate (HR), central and peripheral blood pressures (BP), endothelial function (flow-mediated dilation, FMD), arterial stiffness (pulse-wave velocity, PWV), and cognitive function in patients with MCI

•It was hypothesized that acute mitoquinol intake would improve vascular and cognitive function in patients with MCI

METHODS

•In 2 study visits, 1 patient with MCI (male, age 84) received mitoquinol mesylate (80 mg) or placebo (PL, similar in appearance and taste) in a crossover study design
•At each visit measurements of height, weight, body composition, hand grip strength, HR, BP, brachial and popliteal FMD, PWV, and cognitive function were measured before and after mitoquinol and placebo intake

METHODS



Flow-mediated dilation: measurement of endothelial function using doppler ultrasound

Pulse-wave velocity: measurement arterial stiffness using applanation tonometry

RESULTS

Table 1. Participant characteristics at the placebo and mitoquinol intake visits (n=1)

	Placebo (n=1)	Mitoquinol (n=1)	Δ
Age, y	84.0	84.0	0
Height, cm	164.0	164.0	0
Body mass, kg	83.4	81.2	2.2
BMI, kg/m^2	31.0	30.8	-0.2
Body fat, %	37.6	38.7	1.1
R handgrip strength, kg	34.0	34.0	0
L handgrip strength, kg	36.0	36.0	0

Table 2. Measurements of heart rate, central and peripheral blood pressures, and vascular function pre- and post-placebo and mitoquinol intake

	Placebo (n=1)		Mitoquinol (n=1)	
	Pre	Post	Pre	Post
RHR, bpm	81.0	82.0	81.0	81.0
Systolic BP, mmHg	138.0	147.0	140.0	140.0
Diastolic BP, mmHg	95.0	98.0	92.0	84.0
Central systolic BP, mmHg	123.0	128.0	139.0	130.0
Central diastolic BP, mmHg	94.0	94.0	92.0	84.0
Deceleration time, ms	524.0	641.0	665.0	411.0
Max dP/dt, mmHg/s	720.0	730.0	930.0	680.0
Peripheral PP, mmHg	48.0	56.0	41.0	35.0
Central PP, mmHg	47.0	46.0	34.0	36.0
Augmentation pressure, mmHg	6.0	2.0	12.0	17.0
AIx, %	18.0	26.3	26.3	37.0

RESULTS

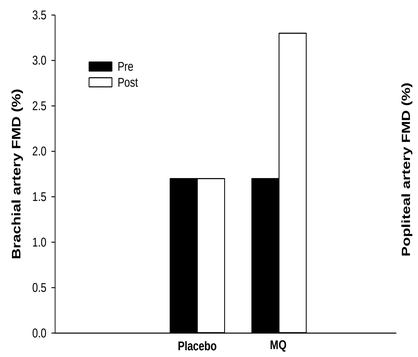


Figure 1. Brachial artery FMD (%) pre- and post-placebo and mitoquinol intake (n=1)

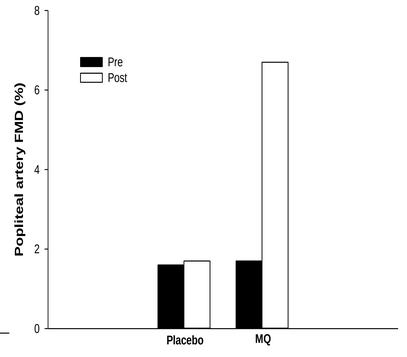


Figure 2. Popliteal artery FMD (%) pre- and post-placebo and mitoquinol intake (n=1)

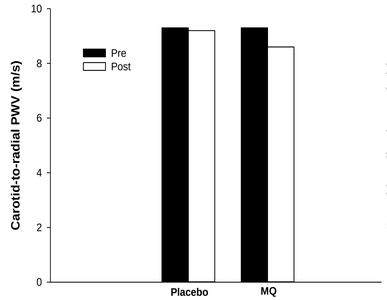


Figure 3. Carotid-to-radial PWV (m/s) pre- and post-placebo and mitoquinol intake (n=1)

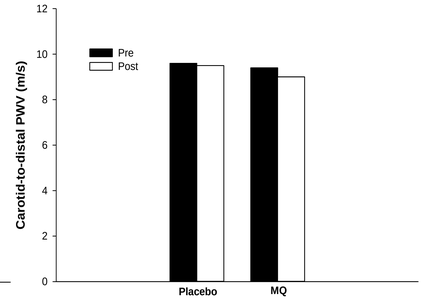


Figure 4. Carotid-to-distal PWV (m/s) pre- and post-placebo and mitoquinol intake (n=1)

CONCLUSIONS

•Our preliminary results demonstrate that mitoquinol intake may be a potentially useful therapeutic treatment for improving vascular function via endothelial-dependent vasodilatory mechanisms in patients with MCI
•However, this was a case study and investigation with a larger sample size is warranted to fully elucidate these results

This project was funded by the Fund for Undergraduate Scholarly Experience (FUSE) grant.