Safety and Efficacy of Lomecel-B in Patients with Mild Alzheimer's Disease: Results of a Double-Blinded, Randomized, Placebo-Controlled Phase 1 Clinical Trial

POSTER #57581

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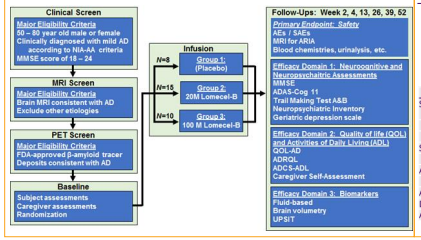
Lomecel-B is a cell-based investigational therapy found to be safe for patients with mild Alzheimer's diseases in this Phase 1 clinical trial. Efficacy data supports Lomecel-B as a potential disease-altering therapeutic. Biomarker results support pleiotropic mechanisms of action of Lomecel-B.

INTRODUCTION

Lomecel-B is a medicinal signaling cell (MSC) formulation under clinical evaluation for Alzheimer's disease (AD). Pleiotropic mechanisms of action, which include pro-vascular and anti-inflammatory activities, make Lomecel-B promising for simultaneously targeting multiple aspects of AD pathology.

METHODS

Phase 1 trial: randomized, double-blinded, placebo-controlled. A single IV infusion of Lomecel-B at 20 (20M) or 100 (100M) million cells, or placebo, was given to each subject. This trial was powered for safety, and not efficacy.



RESULTS

Patient demographics.

	Placebo (n=8)	20M Lomecel-B (n=15)	100M Lomecel-B (n=10)
Age (Years) Mean ± SD	75.9 ± 5.03	70.1 ± 9.49	69.3 ± 8.08
Female sex [n (%)]	6 (75.0)	4 (26.7)	6 (60.0)
Clinical assessment (Points) [Mean ± SD (range)]			
Mini Mental State Exam	20.45 ± 1.46 (18.0 – 22.0)	20.60 ± 2.06 (18.0 – 23.0)	20.70 ± 2.26 (18.0 – 24.0)
ADAS-cog-11	23.46 ± 6.34 (15.7 – 37.7)	24.71 ± 8.49 (12.7 – 43.3)	25.07 ± 8.30 (12.7 – 38.7)
QOL-AD (patient version)	36.3 ± 7.3 (25 – 44)	37.4 ± 4.8 (30 – 46)	37.5 ± 4.9 (30 – 45)
ADCS-ADL	57.60 ± 11.16 (44.0 – 74.0)	58.93 ± 13.33 (31.0 – 73.0)	50.40 ± 19.87 (20.0 – 73.0)
Plasma Biomarkers (pg/mL) [Mean ± SD (range)]			
IL-4 (pg/mL)	0.08 ± 0.04 (0.04 – 0.12)	0.13 ± 0.10 (0.04 – 0.34)	0.10 ± 0.06 (0.04 – 0.23)
IL-6 (pg/mL)	4.52 ± 8.21 (0.76 – 24.79)	1.94 ± 1.85 (0.71 – 6.98)	1.68 ± 1.15 (0.82 – 4.80)
IL-10 (pg/mL)	0.73 ± 0.89 (0.19 – 2.90)	0.51 ± 0.23 (0.15 – 1.16)	0.46 ± 0.20 (0.19 – 0.91)
VEGF (pg/mL)	52.1 ± 20.3 (32 – 86)	42.8 ± 28.6 (11 – 126)	60.9 ± 39.1 (15 – 129)
Aβ38 (pg/mL)	143.9 ± 228.7 (26.6 – 630.2)	37573.2 ± 136662.1 (26.6 – 531361.8)	40.1 ± 28.6 (26.6 – 95.5)
Aβ40 (pg/mL)	65.1 ± 60.4 (12.1 – 189.2)	2457.1 ± 7676.0 (21.0 – 29952.8)	82.2 ± 47.8 (26.6 – 159.5)
Aβ42 (pg/mL)	12.9 ± 11.2 (5.2 – 39.7)	1061.4 ± 3520.2 (7.9 – 13756.2)	11.5 ± 7.2 (5.2 – 28.8)

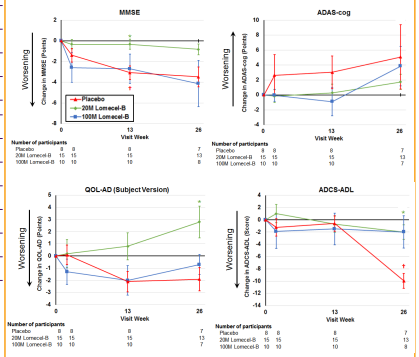
Lomecel-B was found safe at both 20M and 100M doses. Study Stopping Rules were not triggered (primary endpoint).

Adverse Event (AE) and Serious AE (SAE) Category	Placebo	20M Lomecel-B	100M Lomecel-B
SAEs occurring within 30 days after treatment (defined as TE-SAEs used for Stopping Rules trigger) (n)	0	0	1
Subjects with at least one TE-SAE [n (%)]	0	0	1 (10.0%)
Stopping Rules triggered (*primary endpoint*)	0	0	0
SAEs over entire trial (n)	4	2	3
Subjects with at least one SAE [n (%)]	3 (37.5%)	2 (13.3%)	2 (20.0%)
AEs occurring over entire trial (n)	33	23	15
Subjects with at least one AE [n (%)]	7 (87.5%)	10 (66.7%)	5 (50.0%)
AEs or SAEs related to study drug (n)	0	0	0
Deaths on study (n)	0	1 *	0
Alzheimer's-related imaging abnormalities (ARIA) (n)	0	0	0

* Patient withdrew from trial first and subsequently died in an assisted-living facility at day 144 post-infusion.

RESULTS

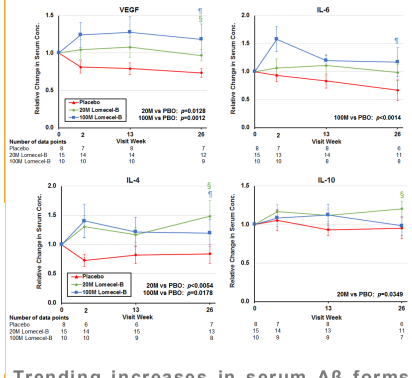
Slower cognitive decline, improved quality-of-life (QOL), and improved activities of daily living (ADLs) in the 20M Lomecel-B arm versus placebo.



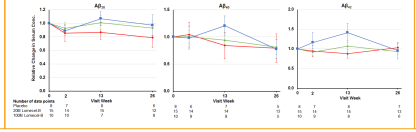
Asterisks: $p<0.05$ for change from baseline in Lomecel-B arm versus change in placebo. Daggers: $p<0.05$ for intra-arm change from baseline. No patient-performed assessment showed worsening versus placebo.

RESULTS

Pro-vascular and anti-inflammatory serum biomarkers were higher after Lomecel-B infusion versus placebo.



Trending increases in serum Aβ forms after Lomecel-B infusion.



CONCLUSIONS

- Lomecel-B is safe for AD patients.
  - Primary safety endpoint met.
  - No AEs or SAEs related to product.
  - No ARIA.
- Effect data showed improved cognitive performance, QOL, and ADLs with the 20M Lomecel-B dose versus placebo.
- Serum biomarkers support pleiotropic MOAs including:
  - Anti-inflammatory activities;
  - Pro-vascular activities;
  - Improve blood-brain barrier (BBB) function to clear Aβ forms.
- Paves way for Phase 2 trial powered for efficacy.

ACKNOWLEDGEMENTS

alz.org® | alzheimer's association® Supported by Alzheimer's Association Part the Cloud Challenge on Neuroinflammation grants PTC-C-16-422443 and PTC-CS-19-623225.

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