Presentation Number: LB12

Presentation Title: Modeled Impact of Bypass to an Endovascular-capable Center on Clinical Outcomes: An Analysis of the STRATIS registry

Author Block: Nils H Mueller-Kronast, Tenet Health Care, Delray Beach, FL; Michael T Froehler, Vanderbilt Univ Medical Ctr, Nashville, TN; Reza Jahan, Univ of California Los Angeles, Los Angeles, CA; Osama O Zaidat, St. Vincent Mercy Hosp, Toledo, OH; David S Liebeskind, Jeffrey L Saver, Univ of California Los Angeles, Los Angeles, CA; STRATIS Investigators

Abstract Body:
Background Timely mechanical thrombectomy (MT) significantly improves clinical outcomes in acute ischemic stroke patients. Patient access to MT can be challenging due to limited endovascular-capable centers (ECCs) available. Patients are usually routed to the closest hospital, requiring transfer to an ECC. Transfers to ECCs have been associated with worse functional outcomes in the STRATIS registry.
Methods STRATIS is a prospective, multicenter registry of patients treated with a stent retriever device within 8 hours of onset. Patients transferred from initial hospital to a STRATIS hospital, had an out-of-hospital stroke, called 911, and had stroke location data were included in this analysis. Workflow times were compared against two modeled bypass scenarios: (i) direct routing to the STRATIS hospital (ii) direct routing to an ECC with the shortest driving time (ideal hospital). For bypass modeling driving times, Google Maps Distance Matrix API was used.
Results A total of 236 patients (mean age 66.4 years; 53.8% male) were included in the preliminary analysis. Median baseline NIHSS was 17; 64.4% received IV-tPA. Among 117 ground transfer patients, the median distance from scene to ECC was 18.6 miles. Direct routing was estimated to increase the median EMS arrival to tPA intervals only by 6 and 2 minutes for STRATIS and ideal hospitals, respectively, while the median interval from EMS to puncture would have decreased by 83 and 88 minutes ($p<0.001$). The difference for onset to puncture was 87 min less ($p<0.001$) under ideal bypass, which is predicted to increase good and excellent outcomes from 50.5% to 59.7% and 31.4% to 46.5%, respectively ($p=0.012$, Rankin shift analysis).
Conclusion Direct bypass to an ECC may significantly shorten treatment times and improve clinical outcomes compared to transfer from a non-ECC, without substantially delaying tPA. This benefit increases for shorter transfers, and even air transfer patients might benefit from bypass

Table. Comparison of time intervals and outcomes, actual transfer by ground vs. modeled bypass to ideal center

Interval/Outcome	Actual transfer by ground Mean ± SD (N) [median] (IQR)	Modeled bypass to ideal center Mean ± SD (N) [median] (IQR)	Actual vs. bypass to ideal center p-value
Distance: scene to initial hospital (mi)	8.1 ± 9.1 (115) [4.0] (2.0,11.0)	-	-
Distance: initial to endovascular hospital (mi)	26.9 ± 25.2 (114) [17.0] (10.3,36.0)	-	-
Distance: scene to endovascular hospital (mi)	-	26.9 ± 26.1 (117) [18.6] (8.5,34.4)	-
EMS scene arrival to initial hospital (min)	25.3 ± 10.9 (81) [23.0] (17.0,32.0)	-	-
EMS scene arrival to endovascular door (min)	170.2 ± 61.8 (109) [165.0] (133.0,194.0)	49.4 ± 26.5 (117) [41.0] (31.0,57.0)	<0.001
EMS scene arrival to IV-tPA (min)	83.0 ± 28.8 (71) [78.0] (67.0,89.5)	86.5 ± 25.3 (73) [80.0] (69.0,93.0)	0.578
EMS scene arrival to arterial puncture (min)	225.1 ± 70.8 (115) [218.0] (183.0,255.0)	138.3 ± 26.6 (115) [130.0] (119.5,145.5)	<0.001
mRS at 90 days (shift analysis)	-	-	0.012
mRS 0-1 at 90 days	31.4% (33/105)	46.5%	-
mRS 0-2 at 90 days	50.5% (53/105)	59.7%	-

EMS scene arrival time interval include imputed measurements for subjects without EMS arrival times measured.

Ideal Center: ≥11 MT procedures billed (all payer) in 2015 and shortest drive time from stroke location.

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Presentation Number: LB14

Presentation Title: Two-year Safety and Clinical Outcomes in Chronic Ischemic Stroke Patients After Implantation of Modified Bone Marrow-derived Mesenchymal Stem Cells (sb623): A Phase 1/2a Study

Author Block: Gary K Steinberg, Stanford Univ, Stanford, CA; Douglas Kondziolka, New York Univ, New York, NY; Lawrence R Wechsler, L D Lunsford, Univ of Pittsburgh, Pittsburgh, PA; Anthony S Kim, Univ of California, San Francisco, San Francisco, CA; Jeremiah N Johnson, Stanford Univ, Stanford, CA; Damien Bates, SanBio, Inc., Mountain View, CA; Gene Poggio, Biostatistical Consulting Inc., Lexington, MA; Casey Case, Michael McGrogan, Ernest W Yankee, SanBio, Inc., Mountain View, CA; Neil E Schwartz, Stanford Univ, Stanford, CA

Abstract Body:
Objective Ischemic stroke is a leading cause of long-term disability. Reports from pilot stage clinical studies indicate that stem cell-based treatments may improve neurological function secondary to chronic stroke.
Methods This was a two-year, open-label, single-arm, Phase 1/2a study (NCT01287936) to evaluate safety and clinical outcomes associated with surgical implantation of modified bone marrow-derived mesenchymal stem cells (SB623) in 18 patients with stable chronic ischemic stroke.
Results All patients experienced at least one treatment-emergent adverse event (TEAE). No patients withdrew due to adverse events, and there were no dose-limiting toxicities or deaths. The most frequent TEAE was headache related to surgical procedure (88.9%). Seven patients experienced nine serious adverse events, which resolved without sequelae. In 16 patients who completed 24 months of treatment, statistically significant improvements from baseline (mean) were reported for: European Stroke Scale (ESS): 5.7 (95% CI, 1.4-10.1; $p<0.05$), National Institutes of Health Stroke Scale (NIHSS): -2.1 (95% CI, -3.3 to -1.0; $p<0.01$), Fugl‑Meyer (F-M) total score: 19.4 (95% CI, 9.9-29.0; $p<0.01$), and F-M motor function total score: 10.4 (95% CI, 4.0-16.7; $p<0.01$) at 24 months. There were no statistically significant changes in the modified Rankin Scale. The size of transient lesions detected by T2 FLAIR imaging in the ipsilateral cortex at Weeks 1-2 post-implantation significantly correlated with improvement of ESS (0.619, $p<0.05$) and NIHSS (-0.735, $p<0.01$) at 24 months.
Conclusions In this completed two-year Phase 1/2a study, implantation of SB623 cells in patients with stable chronic stroke was safe and was accompanied by improvements in clinical outcomes.
Key Words Bone marrow-derived mesenchymal stem cells, SB623 cells, stable chronic stroke, stereotactic transplantation, phase 1/2a study

Author Disclosure Block: **G.K. Steinberg:** Consultant/Advisory Board; Modest; Qool Therapeutics, Peter Lazic US, Inc., NeuroSave. **D. Kondziolka:** Consultant/Advisory Board; Modest; Elekta AB. **L.R. Wechsler:**Research Grant; Modest; Athersys, Inc.. Ownership Interest; Modest; Silk Road Medical, Remedy Pharm. **L.D. Lunsford:** Ownership Interest; Modest; Elekta AB. Consultant/Advisory Board; Modest; Elekta AB. **A.S. Kim:** Research Grant; Modest; BioGen Idec. **J.N. Johnson:** None. **D. Bates:** Employment; Significant; SanBio, Inc. **G. Poggio:** Consultant/Advisory Board; Significant; SanBio, Inc. **C. Case:** Ownership Interest; Modest; SanBio, Inc. **M. McGrogan:** Employment; Significant; SanBio, Inc.. Ownership Interest; Modest; SanBio, Inc. **E.W. Yankee:** Ownership Interest; Modest; SanBio, Inc.. Consultant/Advisory Board; Modest; SanBio, Inc.. **N.E. Schwartz:** None.