Introduction:
Post-stroke physical deficiency occurs frequently in patients with cerebral-vascular accident (CVA) including weakness, numbness, or paralysis on one side of the body. Hyperbaric oxygen therapy (HBOT) has been shown to promote angiogenesis and ischemic tissue oxygenation and induce neurogenesis. Studies have shown that HBOT induces neuroplasticity, increasing the ability of neurons to function and communicate with each other. Clinically, after HBOT, motor functions and cognition of post-stroke patients showed improvement in the chronic stage.

Case presentation:
We report a 71-year-old Emirati male presented 3 months following the history of repetitive ischemic strokes. His symptoms included an increase in postural tone, muscle weakness on his left side, oedema in his left hand and foot, and pain on active and passive movement of both upper and lower limb on the left side. He was unable to transfer independently, not taking weight through his left leg in supported standing and was unable to walk. He was totally dependent on his caregiver in all his self-care activities, and he was wheelchair dependent.

Methodology:
He received The Aviv Adult Neuro-Program which includes:

- Sixty sessions of HBOT delivered via facemask at 2 ATA for 90 minutes. Each session included exposure to 100% oxygen, with 5-minute air breaks every 20 minutes in a multiplace chamber, five days a week for 12 weeks.
- 45-minute physical therapy sessions given 4 times weekly, and 45-minute Occupational therapy sessions twice per week.

The following parameters were measured before and after treatment:
- Pulmonary function testing using spirometry.
- Modified Ashworth Scale
- Modified Barthel Index (MBI)
- Numeric pain scale
- Oedema Grading System
- Hand grip strength using a dynamometer

Outcome/Results:

Spirometry:
Pre:

<table>
<thead>
<tr>
<th>Test</th>
<th>Pre-treatment</th>
<th>Post-treatment</th>
<th>% Increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>FVC</td>
<td>1.29L</td>
<td>2.43L</td>
<td>46.91</td>
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<tr>
<td>FEV1</td>
<td>1.26L</td>
<td>2.22L</td>
<td>43.24</td>
</tr>
</tbody>
</table>

MBI is a scale used to measure performance in activities of daily living (ADL) such as toileting, dressing, bathing, etc. The maximum score is 100 (Independent in all ADL). Client scored 34/100 in MBI pre-treatment. Then he scored 63/100 when he completed the program.

Grip Strength:
Measured with Hand dynamometer:
Unable to hold dynameter with left hand strength was measured as 0 in pre-treatment. He was able to hold the dynamometer post treatment with left hand strength measured as 6.67kg

Conclusion:
HBOT promotes brain neuroplasticity in the chronic stage post stroke. Which result in significant improvement in objective and functional abilities following a combination of HBOT, physiotherapy, and occupational therapy.

References: