Fig. S1. Example the somatosensory evoked potential (SEP) for one subject in the TMS group. Patients had shorter latency of N20 and higher wave amplitude of N20-P25 after treatment (c and d) compared to pre-treatment (a and b).

Fig. S2. Example the somatosensory evoked potential (SEP) for one subject in the sham group. No obvious changes.
were observed in latency of N20 and wave amplitude of N20-P25 for this patient before (a and b) and treatment after (c and d).

Fig. S3 Example the brain stem auditory evoked potentials (BAEP) for one subject in the TMS group. The BAEP responses (a and b) were moderate abnormality with poor waveform differentiation before intervention. The waves I to V were mild abnormality with moderate waveform differentiation after intervention (c and d).
Fig. S4 Example the brain stem auditory evoked potentials (BAEP) for one subject in the sham group. No obvious improvement was observed in waveform differentiation before (a and b) and after intervention (c and d).

Table S1. Parameters of somatosensory evoked potential (SEP) and brain stem auditory evoked potential (BAEP) for the above figures

|        | SEP | BAEP |
|--------|-----|------|
|        | Latencies of N20 component (ms) | N20-P25 amplitudes (uV) | Grade |
|        | Left | Right | Left | Right | Grade | Left | Right |
| Real   |      |       |      |       |       |      |       |
| Before | 22.74 | 21.67 | 2.53 | 1.69  | III   | III  |
| After  | 20.22 | 20.34 | 10.88| 4.87  | III   | II   |
| Sham   |      |       |      |       |       |      |       |
| Before | 21.59 | 22.50 | 1.63 | 0.50  | III   | III  |
| After  | 22.52 | 20.97 | 0.63 | 0.23  | III   | III  |
| Group | Patient | Age | Duration | Etiology | CRS-R | GCS | | Pre-intervention | Post-intervention | Pre-intervention | Post-intervention |
|-------|---------|-----|----------|----------|-------|-----|----------|------------------|------------------|------------------|------------------|
|       |         |     |          |          |       |     | A  | V  | M  | OM | C  | Ar | Total |       | A  | V  | M  | OM | C  | Ar | Total | E   | Verbal response | Best motor response | Total | E   | Verbal response | Best motor response | Total |
|       |         |     |          |          |       |     | 2  | 1  | 2  | 1  | 0  | 1  | 7    | 2  | 4  | 4  | 2  | 1  | 2  | 15  | 3   | 1  | 3  | 7  | 4  | 1  | 5  | 10  |
| 1     | 45      | 3   |          | Stroke   | 2     | 1   | 2  | 1  | 0  | 2  | 8  | 3  | 3    | 3  | 3  | 2  | 1  | 2  | 14 | 4   | 1  | 3  | 8  | 4  | 1  | 4  | 9   |
| 2     | 48      | 1   |          | Stroke   | 1     | 2   | 2  | 1  | 0  | 2  | 8  | 2  | 3  | 3  | 2  | 1  | 3  | 13  | 4   | 1  | 3  | 8  | 4  | 1  | 4  | 8   |
| 3     | 55      | 3   | TBI      |          | 2     | 2   | 2  | 1  | 0  | 1  | 8  | 2  | 3  | 3  | 2  | 1  | 3  | 14  | 3   | 1  | 4  | 8  | 4  | 1  | 4  | 9   |
| 4     | 56      | 2   | Stroke   |          | 1     | 2   | 2  | 1  | 0  | 1  | 8  | 2  | 3  | 2  | 1  | 3  | 14  | 4   | 1  | 2  | 7  | 4  | 1  | 3  | 8   |
| 5     | 31      | 4   | Anoxia   |          | 1     | 0   | 1  | 0  | 0  | 2  | 4  | 1  | 2  | 2  | 1  | 0  | 2  | 8    | 4   | 1  | 2  | 7  | 4  | 1  | 3  | 8   |
| 6     | 47      | 1   | TBI      |          | 1     | 0   | 2  | 1  | 0  | 2  | 5  | 1  | 1  | 2  | 1  | 1  | 2  | 8    | 4   | 1  | 2  | 7  | 4  | 1  | 3  | 8   |
| 7     | 50      | 1   | TBI      |          | 0     | 2   | 2  | 0  | 0  | 2  | 6  | 1  | 2  | 2  | 1  | 1  | 2  | 9    | 4   | 1  | 3  | 8  | 4  | 1  | 3  | 8   |
| 8     | 52      | 6   | Stroke   |          | 1     | 2   | 2  | 0  | 0  | 2  | 7  | 1  | 2  | 2  | 1  | 0  | 2  | 8    | 4   | 1  | 3  | 8  | 4  | 1  | 3  | 8   |
| 9     | 70      | 3   | Stroke   |          | 1     | 0   | 2  | 0  | 0  | 2  | 5  | 1  | 1  | 2  | 1  | 0  | 2  | 7    | 4   | 1  | 3  | 7  | 4  | 2  | 3  | 9   |
| 10    | 28      | 3   | TBI      |          | 2     | 2   | 2  | 1  | 0  | 3  | 10 | 3  | 3  | 3  | 2  | 1  | 3  | 15   | 4   | 1  | 3  | 8  | 4  | 3  | 4  | 11   |
| 11    | 34      | 1   | TBI      |          | 2     | 3   | 2  | 1  | 1  | 3  | 12 | 2  | 3  | 2  | 2  | 1  | 3  | 13   | 4   | 1  | 3  | 8  | 4  | 2  | 3  | 9   |
| 12    | 29      | 1   | Stroke   |          | 1     | 2   | 2  | 1  | 1  | 2  | 9  | 2  | 2  | 3  | 2  | 2  | 3  | 14   | 4   | 1  | 3  | 8  | 4  | 2  | 4  | 10   |
| 13    | 56      | 1   | Stroke   |          | 1     | 0   | 3  | 0  | 0  | 0  | 4  | 1  | 1  | 3  | 1  | 1  | 2  | 9    | 1   | 1  | 4  | 6  | 4  | 1  | 4  | 9    |
| 14    | 27      | 5   | TBI      |          | 2     | 2   | 2  | 2  | 0  | 2  | 10 | 2  | 3  | 3  | 2  | 1  | 2  | 13   | 4   | 1  | 3  | 8  | 4  | 2  | 4  | 10   |
| 15    | 57      | 2   | Stroke   |          | 0     | 0   | 1  | 1  | 0  | 2  | 4  | 1  | 1  | 2  | 1  | 0  | 2  | 7    | 4   | 1  | 2  | 7  | 4  | 1  | 3  | 8    |
| 16    | 54      | 3   | TBI      |          | 1     | 2   | 1  | 0  | 0  | 2  | 6  | 1  | 2  | 2  | 1  | 0  | 3  | 9    | 4   | 1  | 2  | 7  | 4  | 1  | 3  | 8    |
| 17    | 60      | 3   | Stroke   |          | 2     | 2   | 2  | 1  | 0  | 3  | 10 | 3  | 3  | 2  | 2  | 1  | 2  | 13   | 4   | 1  | 3  | 8  | 4  | 1  | 3  | 8    |
| 18    | 68      | 2   | TBI      |          | 1     | 0   | 2  | 1  | 0  | 2  | 6  | 1  | 1  | 2  | 1  | 0  | 2  | 7    | 4   | 1  | 3  | 8  | 4  | 1  | 3  | 8    |
| 19    | 68      | 1   | TBI      |          | 1     | 0   | 2  | 2  | 0  | 2  | 7  | 1  | 1  | 2  | 2  | 0  | 2  | 8    | 4   | 1  | 3  | 8  | 4  | 2  | 3  | 9    |
| 20 | 65 | 1 | TBI | 2 | 2 | 2 | 2 | 0 | 2 | 10 | 2 | 2 | 2 | 2 | 0 | 2 | 10 | 4 | 1 | 3 | 8 | 4 | 1 | 3 | 8 |
| 21 | 33 | 2 | Anoxia | 0 | 0 | 1 | 1 | 0 | 2 | 4 | 1 | 1 | 1 | 1 | 1 | 2 | 7 | 4 | 1 | 2 | 7 | 4 | 1 | 2 | 7 |
| 22 | 45 | 3 | Anoxia | 1 | 2 | 1 | 0 | 0 | 2 | 6 | 1 | 1 | 1 | 0 | 0 | 2 | 7 | 4 | 1 | 2 | 7 | 4 | 1 | 3 | 8 |
| 23 | 50 | 3 | TBI | 2 | 3 | 1 | 1 | 0 | 3 | 10 | 2 | 3 | 1 | 1 | 0 | 3 | 10 | 4 | 1 | 3 | 8 | 4 | 1 | 3 | 8 |
| 24 | 63 | 4 | TBI | 1 | 0 | 2 | 1 | 0 | 2 | 6 | 1 | 1 | 2 | 1 | 0 | 2 | 7 | 4 | 1 | 3 | 8 | 4 | 1 | 3 | 8 |
| 25 | 72 | 4 | Stroke | 1 | 0 | 2 | 2 | 0 | 2 | 7 | 1 | 1 | 2 | 1 | 0 | 2 | 9 | 4 | 1 | 3 | 8 | 4 | 2 | 3 | 9 |

| 1 | 33 | 2 | TBI | 2 | 2 | 3 | 1 | 0 | 2 | 10 | 2 | 3 | 3 | 2 | 1 | 2 | 13 | 4 | 1 | 4 | 9 | 4 | 1 | 4 | 9 |
| 2 | 35 | 6 | Anoxia | 1 | 1 | 1 | 0 | 0 | 2 | 5 | 2 | 1 | 1 | 1 | 0 | 2 | 7 | 4 | 1 | 2 | 7 | 4 | 1 | 2 | 7 |
| 3 | 73 | 6 | Stroke | 1 | 1 | 2 | 1 | 0 | 1 | 6 | 2 | 1 | 2 | 1 | 0 | 1 | 7 | 4 | 1 | 3 | 8 | 4 | 1 | 3 | 8 |
| 4 | 79 | 1 | Anoxia | 0 | 0 | 2 | 1 | 0 | 1 | 4 | 1 | 1 | 2 | 2 | 0 | 1 | 7 | 1 | 1 | 3 | 5 | 2 | 1 | 3 | 6 |
| 5 | 50 | 1 | Stroke | 1 | 1 | 2 | 1 | 0 | 1 | 6 | 1 | 1 | 2 | 1 | 0 | 1 | 6 | 4 | 1 | 3 | 8 | 3 | 1 | 4 | 8 |
| 6 | 58 | 4 | TBI | 1 | 1 | 1 | 1 | 0 | 1 | 5 | 1 | 1 | 2 | 1 | 0 | 1 | 6 | 3 | 1 | 2 | 6 | 3 | 1 | 3 | 7 |
| 7 | 66 | 1 | Stroke | 1 | 1 | 2 | 1 | 0 | 1 | 7 | 2 | 2 | 2 | 1 | 0 | 1 | 9 | 3 | 1 | 3 | 7 | 3 | 1 | 3 | 7 |
| 8 | 55 | 1 | TBI | 1 | 2 | 2 | 1 | 0 | 2 | 8 | 2 | 2 | 2 | 1 | 0 | 2 | 9 | 4 | 1 | 3 | 8 | 4 | 1 | 3 | 8 |
| 9 | 41 | 6 | TBI | 1 | 2 | 2 | 1 | 0 | 2 | 8 | 2 | 2 | 2 | 1 | 0 | 2 | 9 | 4 | 1 | 3 | 8 | 4 | 1 | 3 | 8 |
| 10 | 52 | 3 | Stroke | 2 | 2 | 2 | 1 | 0 | 1 | 8 | 2 | 2 | 2 | 1 | 0 | 1 | 8 | 3 | 1 | 4 | 8 | 4 | 1 | 4 | 9 |
| 11 | 44 | 3 | Anoxia | 1 | 0 | 1 | 0 | 0 | 2 | 4 | 1 | 1 | 1 | 0 | 0 | 2 | 5 | 4 | 1 | 2 | 7 | 4 | 1 | 3 | 8 |
| 12 | 67 | 1 | TBI | 0 | 0 | 2 | 1 | 0 | 2 | 5 | 2 | 1 | 2 | 1 | 0 | 2 | 8 | 4 | 1 | 2 | 7 | 4 | 1 | 2 | 7 |
| 13 | 66 | 1 | TBI | 0 | 2 | 2 | 0 | 0 | 2 | 6 | 2 | 2 | 2 | 1 | 0 | 2 | 9 | 4 | 1 | 3 | 8 | 4 | 1 | 3 | 8 |
| 14 | 70 | 1 | Stroke | 1 | 2 | 2 | 0 | 0 | 0 | 2 | 7 | 1 | 2 | 2 | 1 | 0 | 2 | 8 | 4 | 1 | 3 | 8 | 4 | 1 | 3 | 8 |
| 15 | 45 | 5 | Stroke | 1 | 0 | 2 | 0 | 0 | 1 | 5 | 1 | 0 | 2 | 0 | 0 | 2 | 5 | 3 | 1 | 3 | 7 | 4 | 1 | 2 | 7 |
| 16 | 51 | 2 | TBI | 2 | 2 | 2 | 1 | 0 | 3 | 10 | 2 | 2 | 2 | 1 | 0 | 3 | 10 | 4 | 1 | 3 | 8 | 4 | 1 | 3 | 8 |
| 17 | 47 | 3 | TBI | 2 | 3 | 2 | 1 | 1 | 3 | 12 | 3 | 3 | 2 | 2 | 1 | 3 | 14 | 4 | 1 | 3 | 8 | 4 | 1 | 3 | 8 |
| 18 | 58 | 3 | Stroke | 1 | 2 | 2 | 1 | 1 | 2 | 9 | 1 | 2 | 2 | 1 | 1 | 2 | 9 | 4 | 1 | 3 | 8 | 4 | 2 | 3 | 9 |
| 19 | 64 | 2 | Stroke | 1 | 0 | 3 | 0 | 0 | 0 | 4 | 1 | 1 | 3 | 1 | 1 | 6 | 1 | 1 | 4 | 6 | 2 | 1 | 4 | 9 |
| 20 | 52 | 1 | TBI | 2 | 2 | 2 | 2 | 0 | 2 | 10 | 2 | 2 | 2 | 2 | 0 | 2 | 10 | 4 | 1 | 3 | 8 | 3 | 1 | 4 | 8 |
|----|----|---|-----|---|---|---|---|---|---|----|---|---|---|---|---|---|----|---|---|---|---|---|---|---|---|
| 21 | 42 | 1 | Anoxia | 0 | 0 | 1 | 1 | 0 | 2 | 4 | 1 | 1 | 1 | 1 | 0 | 2 | 6 | 4 | 1 | 2 | 7 | 4 | 1 | 3 | 8 |
| 22 | 40 | 2 | Anoxia | 1 | 2 | 1 | 0 | 0 | 2 | 6 | 1 | 2 | 1 | 0 | 0 | 2 | 6 | 4 | 1 | 2 | 7 | 4 | 2 | 2 | 8 |
| 23 | 34 | 3 | Stroke | 2 | 3 | 1 | 1 | 0 | 3 | 10 | 2 | 3 | 1 | 1 | 0 | 3 | 10 | 4 | 1 | 3 | 8 | 4 | 2 | 2 | 8 |
| 24 | 70 | 3 | Anoxia | 1 | 0 | 2 | 1 | 0 | 2 | 6 | 1 | 1 | 2 | 1 | 0 | 2 | 7 | 4 | 1 | 3 | 8 | 4 | 1 | 3 | 8 |
| 25 | 23 | 2 | Anoxia | 1 | 0 | 2 | 2 | 0 | 2 | 7 | 2 | 1 | 2 | 2 | 0 | 2 | 9 | 4 | 1 | 3 | 8 | 4 | 1 | 3 | 8 |

Abbreviations: TBI: traumatic brain injury, CRS-R, Coma Recovery Scale-Revised; A, auditory; Ar, arousal; C, communication; M, motor; OM, oro-motor; V, visual; GCS: Glasgow Coma Scale; E, eye-opening.