**Supplementary Tables**

**Supplementary Table 1: Comparative analysis of subgroups and responses with significant differences in management of intracranial abscesses**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Peds** | **Adult** | ***p*-value** | **Trainee** | **Staff** | ***p*-value** | **<10 years practice** | **>10 years****practice**  | ***p*-value** | **<1 consult/ month** | **>1 consult/ month** | ***p-value*** | **Aware of Guidelines** | **Not aware of Guidelines** | ***p-value*** |
| **How do you manage intracerebral abscesses neurosurgically? (Surgeon-preference)** |
| I only aspiration the abscess cavity | 20 (40.0) | 6 (50.0) | 0.083 | 6 (14.6) | 26 (41.9) | 0.014 | 15 (22.1) | 17 (50.0) | **0.012** | 24 (36.9) | 8 (21.1) | 0.238 | 3 (12.5) | 29 (36.7) | **0.049** |
| I believe the abscess capsule must be fully resected | 0  | 1 (8.3) | 1 (2.4) | 1 (1.6) | 2 (2.9) | 0 ) | 1 (1.5) | 1 (2.6) | 0  | 2 (2.5) |
| I perform either aspiration or resection of the abscess capsule depending on clinical and radiological factors. | 30 (60.0) | 5 (41.7) | 34 (82.9) | 35 (56.5) | 51 (75.0) | 17 (50.0) | 40 (61.5) | 29 (76.3) | 21 (87.5) | 48 (60.8) |
| **Neurosurgical excision via craniotomy over aspiration through burr hole is preferred with superficial lesions NOT located in the eloquent areas of the brain.**  |
| Yes | 28 (56.0) | 2 (16.7) | **0.014** | 32 (78.0) | 30 (48.4) | **0.002** | 51 (75.0) | 10 (29.4) | **<0.001** | 35 (53.8) | 27 (71.1) | 0.085 | 18 (75.0) | 44 (55.7) | 0.091 |
| No | 22 (44.0) | 10 (83.3) | 9 (22.0) | 32 (51.6) | 17 (25.0) | 24 (70.6) | 30 (46.2) | 11 (28.9) | 6 (25.0) | 35 (44.3) |
| **Neurosurgical excision via craniotomy over aspiration through burr hole is preferred when the abscess produces a mass effect leading to brain herniation**  |
| Yes | 32 (64.0) | 6 (50.0) | 0.371 | 39 (95.1) | 38 (61.3) | **<0.001** | 58 (85.3) | 18 (52.9) | **<0.001** | 43 (66.2) | 34 (89.5) | 0.009 | 20 (83.3) | 57 (72.2) | 0.269 |
| No | 18 (36.0) | 6 (50.0) | 2 (4.9) | 24 (38.7) | 10 (14.7) | 16 (47.1) | 22 (33.8) | 4 (10.5) | 4 (16.7) | 22 (27.8) |
| **Neurosurgical excision via craniotomy over aspiration through burr hole is preferred when the abscess capsule is considered "thick", and the abscess appears radiologically "mature”.** |
| True | 26 (48.0) | 2 (16.7) | **0.027** | 27 (65.9) | 28 (45.2) | **0.039** | 41 (60.3) | 13 (82.2) | **0.035** | 33 (50.8) | 22 (57.9) | 0.484 | 14 (58.3) | 41 (51.9) | 0.580 |
| False | 24 (52.0) | 10 (83.3) | 14 (34.1) | 34 (54.8) | 27 (39.7) | 21 (61.8) | 32 (49.2) | 16 (42.1) | 10 (41.7) | 38 (48.1) |
| **Is there any role for antibiotic administration directly into the abscess cavity?** |
| Yes | 1 (2.0) | 0  |  0.553 | 2 (4.9) | 1 (1.6) | **0.047** | 2 (2.9) | 0  | 0.081 | 0  | 3 (7.9) | **0.021** | 1 (4.2) | 2 (2.5) | 0.674 |
| No | 28 (56.0) | 5 (41.7) | 12 (29.3) | 33 (53.2) | 25 (36.8) | 20 (58.8) | 33 (50.8) | 12 (31.6) | 12 (50.0) | 33 (41.8) |
| Unsure | 21 (42.0) | 7 (58.3) | 27 (65.9) | 28 (45.2) | 41 (60.3 | 14 (41.2) | 32 (49.2) | 23 (60.5) | 11 (45.8) | 44 (55.7) |
| **When excision is performed, vancomycin powder should be used.** |
| Yes | 0  | 1 (8.3) | 0.074 | 3 (7.3) | 1 (1.6) | **0.001** | 3 (4.4) | 1 (2.9) | 0.077 | 0 | 4 (10.5) | **0.010** | 0  | 4 (5.1) | 0.323 |
| No | 31 (62.0) | 5 (41.7) | 9 (22.0) | 36 (58.1) | 24 (35.3) | 20 (58.8) | 33 (50.8) | 12 (31.6) | 13 (54.2) | 32 (40.5) |
| Unsure | 19 (38.0) | 6 (50.0) | 29 (70.7) | 25 (40.3) | 41 (60.3) | 13 (38.2) | 32 (49.2) | 22 (57.9) | 11 (45.8) | 43 (54.4) |

Data is presented as counts and percentage

**Supplementary Table 2: Association between pediatric *vs* adult neurosurgeons, trainee *vs* staff neurosurgeon, number of years in practice, number of consultations and awareness of any guidelines in the management of intracranial abscesses and respondents’ recommended management of multiple intracranial abscesses**

|  |  |
| --- | --- |
|  **Recommended management** | **Neurosurgeon** |
| **Adult = 50** | **Pediatric = 12** | ***p*-value** |
| IV antibiotics onlyStereotactic aspiration of largest abscess onlyStereotactic aspiration of largest abscess >2.5 cmStereotactic aspiration of all abscessesSurgical abscess excision on largest abscess onlySurgical abscess excision of all abscesses |  18 (36.0)25 (50.0) 0 (0.0) 2 (4.0)2 (4.0) 3 (6.0) |  5 (45.5)2 (18.2) 1 (9.1) 2 (18.2)1 (9.1) 0 (0.0) |   0.057 |
|  **Recommended management** | **Level of training** |
| **Resident/ Fellow = 41** | **Attending = 62** | ***p*-value** |
| IV antibiotics onlyStereotactic aspiration of largest abscess onlyStereotactic aspiration of largest abscess >2.5 cmStereotactic aspiration of all abscessesSurgical abscess excision on largest abscess onlySurgical abscess excision of all abscesses >2.5cmSurgical abscess excision of all abscesses | 16 (40.0)15 (37.5) 2 (5.0) 4 (10.0)2 (5.0) 1 (2.5) 0 (0.0) | 23 (37.7)27 (44.3) 1 (1.6) 4 (6.6)3 (4.9)0 (0.0) 3 (4.9) |     0.535 |
|  **Recommended management** | **Number of years for independent practice** |
| **<10 years experience = 68** | **>10 years experience = 34** | ***p*-value** |
| IV antibiotics onlyStereotactic aspiration of largest abscess onlyStereotactic aspiration of largest abscess >2.5 cmStereotactic aspiration of all abscessesSurgical abscess excision on largest abscess onlySurgical abscess excision of all abscesses >2.5cmSurgical abscess excision of all abscesses | 24 (35.8)27 (40.3) 3 (4.5) 6 (9.0)5 (7.5) 1 (1.5) 1 (1.5) | 14 (42.4)15 (45.5) 0 (0.0)2 (6.1)0 (0.0) 0 (0.0) 2 (6.1) |    0.360 |
|  **Recommended management** | **Average number of consultations per month** |
| **<1 = 65** | **>1= 38** | ***p*-value** |
| IV antibiotics onlyStereotactic aspiration of largest abscess onlyStereotactic aspiration of largest abscess >2.5 cmStereotactic aspiration of all abscessesSurgical abscess excision on largest abscess onlySurgical abscess excision of all abscesses >2.5cmSurgical abscess excision of all abscesses | 23 (35.5)28 (43.8) 2 (3.1) 5 (7.8)3 (4.7) 0 (0.0) 3 (4.7) | 16 (43.2)14 (37.8)1 (2.7)3 (8.1)2 (5.4)1 (2.7) 0 (0.0) |     0.673 |
|  **Recommended management** | **Awareness of Clinical Guidelines** |
| **Yes = 24** |  **No = 79** | ***p*-value** |
| IV antibiotics onlyStereotactic aspiration of largest abscess onlyStereotactic aspiration of largest abscess >2.5 cmStereotactic aspiration of all abscessesSurgical abscess excision on largest abscess onlySurgical abscess excision of all abscesses >2.5cmSurgical abscess excision of all abscesses | 8 (33.3)10 (41.7) 1 (4.2) 1 (4.2)2 (8.3) 0 (0.0) 2 (8.3) | 31 (40.3)32 (41.6)2 (2.6)7 (9.1)3 (3.9)1 (1.3)1 (1.3) |    0.540 |

Data is presented as counts and percentages

**Supplementary Table 3: Association between pediatric *vs* adult neurosurgeons, trainee *vs* staff neurosurgeon, number of years in practice, number of consultations and awareness of any guidelines in the management of intracranial abscesses and respondents’ recommended management of intracranial abscess with intraventricular rupture**

|  |  |
| --- | --- |
|  **Recommended management** | **Neurosurgeon** |
| **Adult =50** | **Pediatric = 12** | ***p*-value** |
| IV antibiotics onlyStereotactic aspirationStereotactic aspiration and insertion of external ventricular drain (EVD)Surgical excision of abscessSurgical excision of abscess and insertion of external ventricular drain (EVD) on largest abscess only |  -12 (24.5)18 (36.7) 6 (12.2)13 (26.5)  |  -3 (30.0)3 (30.0) 2 (20.0)2 (20.0)  |    0.870 |
|  **Recommended management** | **Level of training** |
| **Resident/ Fellow = 41** | **Attending = 62** | ***p*-value** |
| IV antibiotics onlyStereotactic aspirationStereotactic aspiration and insertion of external ventricular drain (EVD)Surgical excision of abscessSurgical excision of abscess and insertion of external ventricular drain (EVD) on largest abscess only | -2 (5.0)8 (20.0) 12 (30.0)18 (45.0) | -15 (25.4)21 (35.6) 8 (13.6)15 (25.4) |    **0.003** |
|  **Recommended management** | **Number of years for independent practice** |
| **<10 years experience= 68** | **>10 years experience= 34** | ***p*-value** |
| IV antibiotics onlyStereotactic aspirationStereotactic aspiration and insertion of external ventricular drain (EVD)Surgical excision of abscessSurgical excision of abscess and insertion of external ventricular drain (EVD) on largest abscess only | -9 (13.6)12 (18.2) 15 (22.7)30 (45.5) | -8 (25.0)17 (53.1) 4 (12.5)3 (9.4) |    **<0.001** |
|  **Recommended management** | **Number of consultations in an average month** |
| **<1 = 65** | **>1 = 38** | ***p*-value** |
| IV antibiotics onlyStereotactic aspirationStereotactic aspiration and insertion of external ventricular drain (EVD)Surgical excision of abscessSurgical excision of abscess and insertion of external ventricular drain (EVD) on largest abscess only | -15 (24.2)24 (38.7) 7 (11.3)16 (25.8) | -2 (5.4)5 (13.5) 13 (35.1)17 (45.9) |    **<0.001** |
|  **Recommended management** | **Awareness of Clinical Guidelines** |
| **Yes = 24** | **No =79** | ***p*-value** |
| IV antibiotics onlyStereotactic aspirationStereotactic aspiration and insertion of external ventricular drain (EVD)Surgical excision of abscessSurgical excision of abscess and insertion of external ventricular drain (EVD) on largest abscess only | -8 (34.8)5 (21.7) 2 (8.7)8 (34.8) | -9 (11.8)24 (31.6) 18 (23.7)25 (32.9) |   **0.045** |

Data is presented as counts and percentages

**Supplementary Table 4: Association between pediatric *vs* adult neurosurgeons, trainee *vs* staff neurosurgeon, number of years in practice, number of consultations and awareness of any guidelines in the management of intracranial abscesses and respondents’ recommended management pediatric intracranial abscesses**

|  |  |
| --- | --- |
|  **Recommended management** | **Neurosurgeon** |
| **Adult = 50** | **Pediatric= 12** | ***p*-value** |
| IV antibiotics onlyStereotactic aspiration of largest abscess onlyStereotactic aspiration of largest abscess>2.5 cmStereotactic aspiration of all abscessesSurgical abscess excision on largest abscess onlySurgical abscess excision of all abscesses >2.5cmSurgical abscess excision of all abscesses |  -23 (46.0)10 (20.0)1 (2.0)13 (26.0) 2 (4.0) 1 (2.0) | -6 (54.4)2 (18.2)0 (0.0)2 (18.2)0 (0.0)1 (9.1) |     0.788 |
|  | **Level of training** |
|  **Recommended management** | **Resident/Fellow =41** | **Attending = 62** | ***p*-value** |
| IV antibiotics onlyStereotactic aspiration of largest abscess onlyStereotactic aspiration of largest abscess>2.5 cmStereotactic aspiration of all abscessesSurgical abscess excision on largest abscess onlySurgical abscess excision of all abscesses >2.5cmSurgical abscess excision of all abscesses | -10 (25.6) 6 (15.4) 1 (2.6)16 (41.0) 5 (12.8) 1 (2.6) | -29 (47.5) 12 (19.7) 1 (1.6)15 (24.6) 2 (3.3) 2 (3.3) | 0.132 |
|  | **Number of years for independent practice** |
|  **Recommended management** | **<10 years experience = 68** | **>10 years experience = 34** | ***p*-value** |
| IV antibiotics onlyStereotactic aspiration of largest abscess onlyStereotactic aspiration of largest abscess>2.5 cmStereotactic aspiration of all abscessesSurgical abscess excision on largest abscess onlySurgical abscess excision of all abscesses >2.5cmSurgical abscess excision of all abscesses | -21 (31.8) 11 (16.7) 2 (3.0)24 (36.4) 6 (9.1) 2 (3.0) | -18 (54.5) 7 (21.2) 0 (0.0)6 (18.2) 1 (3.0) 1 (3.0) |    0.175 |
|  | **Number of consultations in an average month** |
|  **Recommended management** | **<1 = 65** | **>1 = 38** | ***p*-value** |
| IV antibiotics onlyStereotactic aspiration of largest abscess onlyStereotactic aspiration of largest abscess>2.5 cmStereotactic aspiration of all abscessesSurgical abscess excision on largest abscess onlySurgical abscess excision of all abscesses >2.5cmSurgical abscess excision of all abscesses | -31 (48.4) 11 (17.2) 1 (1.6)17 (26.6) 3 (4.7) 1 (1.6) | -8 (22.2) 7 (19.4) 1 (2.8)14 (38.9) 4 (11.1) 2 (5.6) |     0.156 |
|  | **Awareness of Clinical Guidelines** |
|  **Recommended management** | **Yes=24** | **No=79** | ***p*-value** |
| IV antibiotics onlyStereotactic aspiration of largest abscess onlyStereotactic aspiration of largest abscess>2.5 cmStereotactic aspiration of all abscessesSurgical abscess excision on largest abscess onlySurgical abscess excision of all abscesses >2.5cmSurgical abscess excision of all abscesses | -10 (41.7)3 (12.5)0 (0.0)8 (33.3)2 (8.3) 1 (4.2) | -29 (38.2)15 (19.7)2 (2.6)23 (30.3)5 (6.6)2 (2.6) |     0.913 |

 Data is presented as counts and percentages