Chemotherapy should not be withheld from patients with an indwelling pleural catheter for malignant pleural effusion

A 1–12% rate of pleural infection has been observed in patients with an indwelling pleural catheter (IPC) to manage malignant pleural effusion (MPE), leading to concern that systemic chemotherapy may increase infection risk.1–3 This study aimed to determine whether chemotherapy increases the infection rate in patients with an IPC.

Data were collected from a prospectively maintained database, hospital notes and electronic records in a tertiary centre. All patients who had an IPC inserted between May 2006 and January 2010 to treat an MPE without pleural infection at the time of insertion were included. Pleural infection was defined as satisfying all of the following criteria: (1) positive pleural fluid culture; (2) symptoms of infection; and (3) treatment with antibiotics.

Eighty-two IPC placements in 78 patients with an MPE were included (table 1). Malignancies included breast cancer (n=21), mesothelioma (n=18), non-small cell lung cancer (n=15) and adenocarcinoma of unknown origin (n=8). Of 44 patients who received systemic chemotherapy (including cytotoxic chemotherapy and targeted therapies), 23 had an IPC during chemotherapy (table 1) (see online supplement for details of chemotherapy regimens). On average, patients had 2.5 cycles of chemotherapy with an IPC present (range 1–7 cycles). None of these 23 patients had WHO grade III or IV toxicities. Ten patients developed neutropenia at some point during their chemotherapy, of whom three had an IPC present at that time. In all cases neutropenia lasted <1 week and none of these patients developed infections.

Seven patients (9%) developed pleural infections, only one of whom was receiving chemotherapy (sunitinib) during the time the IPC was present. There was no difference in infection rate between those who received chemotherapy while the IPC was present and those who did not (Fisher exact test, p=0.667). Of the other six, three had previously received chemotherapy, one had chemotherapy after treatment of the infection and two never received chemotherapy.

Nine (11%) other patients had a positive pleural fluid culture (four during chemotherapy without symptoms of infection and not requiring antibiotics. Five of these patients had subsequent negative pleural fluid cultures without antibiotic treatment. This may have been due to colonisation or contamination.

A range of organisms were identified, with Staphylococcus aureus the most common in cases of infection (three cases of infection, one of colonisation) and coagulase-negative Staphylococcus the most common in colonisation (one infection, five colonisation).

The median time the IPC was present was 71 days (range: 6–711). Twenty-nine IPCs were removed prior to death. Although the no chemotherapy group appear to have a shorter IPC duration than the chemotherapy group, this was because of a higher mortality in the no chemotherapy group. The median time from IPC insertion to infection was 105 days (range 40–206). In the three patients who developed infection following previous chemotherapy, the time from last dose of chemotherapy to infection was 301 days (range 90–659).

These results show that systemic chemotherapy did not increase risk of pleural infection in this cohort of patients with IPCs. We conclude that an IPC is not a contraindication to chemotherapy.

<table>
<thead>
<tr>
<th>Table 1 Patient demographics</th>
<th>Systemic chemotherapy while IPC in situ</th>
<th>No systemic chemotherapy while IPC in situ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td>23</td>
<td>59</td>
</tr>
<tr>
<td>Mean age (years)</td>
<td>60</td>
<td>67</td>
</tr>
<tr>
<td>Males: females</td>
<td>11:12</td>
<td>34:25</td>
</tr>
<tr>
<td>Median duration IPC was in situ (days) (range)</td>
<td>84 (11–487)</td>
<td>66 (6–711)</td>
</tr>
<tr>
<td>Median duration IPC was in situ in patients in whom IPC was removed prior to death</td>
<td>84 (11–239)</td>
<td>82 (30–711)</td>
</tr>
<tr>
<td>No. of patients who died with IPC in situ (%)</td>
<td>13 (57%)</td>
<td>40 (68%)</td>
</tr>
<tr>
<td>Average time patient received chemotherapy while IPC was in situ (days) (range)</td>
<td>68 (11–208) (1–2.5 cycles)</td>
<td>—</td>
</tr>
<tr>
<td>Pleural infections</td>
<td>1 (4%)</td>
<td>6 (10%)</td>
</tr>
<tr>
<td>Colonisation of IPC</td>
<td>4 (17%)</td>
<td>5 (8%)</td>
</tr>
</tbody>
</table>

IPC, indwelling pleural catheter.

REFERENCES
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