Introduction

The purpose of this study was to compare the duration of preemptive anidulafungin (AFG) therapy and outcomes following a negative T2MR or BDG test result among intensive care unit (ICU) patients.

Methods

Study Design

• This study was an IRB-approved, retrospective, quasi-experiment in a four hospital system conducted before and after T2MR implementation.

Subjects

• Patients were eligible for inclusion if they were admitted to an ICU, received AFG therapy, and had a negative RDT between May 2014-Oct 2017. T2MR testing was implemented in Nov 2015.

Data Collection and Endpoints

• Data collected using electronic medical records and standardized case report form.

Inclusion Criteria

■ Negative fungal blood culture
■ Negative RDT (BDG in pre-group or T2MR in post-group)
■ Age < 18 years old
■ Solid organ/bone marrow transplant
■ Neutropenia
■ Other indication for antifungal therapy
■ Deceased prior to RDT result

Exclusion Criteria

■ Pregnancy
■ Age ≥ 18 years old
■ Vasopressors on admission
■ SOFA > 7

Clinical Prediction score for Candida

Clinical Prediction score for candidemia

Primary Energy Endpoint

AFG Days of therapy

BDG + T2MR

Baseline Characteristics, n (%) or median, (IQR)

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>BDG (n=79)</th>
<th>T2MR (n=90)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age, years</td>
<td>63 (50.7)</td>
<td>59 (50.7)</td>
</tr>
<tr>
<td>Female</td>
<td>39 (49)</td>
<td>42 (52)</td>
</tr>
<tr>
<td>Liver Disease</td>
<td>19 (24)</td>
<td>22 (27)</td>
</tr>
<tr>
<td>Diabetes</td>
<td>26 (33)</td>
<td>42 (47)</td>
</tr>
<tr>
<td>Kidney Disease</td>
<td>12 (15)</td>
<td>19 (19)</td>
</tr>
<tr>
<td>COPD</td>
<td>17 (22)</td>
<td>21 (21)</td>
</tr>
<tr>
<td>Active Maligancy</td>
<td>14 (18)</td>
<td>12 (13)</td>
</tr>
<tr>
<td>Hemodialysis</td>
<td>13 (15)</td>
<td>25 (27)</td>
</tr>
<tr>
<td>Initial SOFA Score&lt; 3</td>
<td>8 (10.5)</td>
<td>12 (15)</td>
</tr>
<tr>
<td>SOFA score ≥ 3</td>
<td>56 (70)</td>
<td>88 (98)</td>
</tr>
<tr>
<td>Candida Score</td>
<td>2 (2.5)</td>
<td>2 (2.3)</td>
</tr>
<tr>
<td>Severe Sepsis</td>
<td>70 (89)</td>
<td>98 (98)</td>
</tr>
<tr>
<td>ICU Surgery</td>
<td>22 (28)</td>
<td>33 (33)</td>
</tr>
<tr>
<td>TPN</td>
<td>13 (17)</td>
<td>5 (5)</td>
</tr>
<tr>
<td>Multifocal Colonization&lt; 3</td>
<td>13 (17)</td>
<td>6 (6)</td>
</tr>
<tr>
<td>Candida Score ≥ 3</td>
<td>34 (43)</td>
<td>41 (41)</td>
</tr>
<tr>
<td>Central Venous Catheter</td>
<td>78 (99)</td>
<td>93 (93)</td>
</tr>
<tr>
<td>Antimicrobial Tx</td>
<td>52 (66)</td>
<td>75 (75)</td>
</tr>
<tr>
<td>GJ Surgery</td>
<td>14 (18)</td>
<td>13 (13)</td>
</tr>
<tr>
<td>Multiple GI surgery</td>
<td>5 (6)</td>
<td>4 (4)</td>
</tr>
<tr>
<td>Immunosuppression</td>
<td>7 (9)</td>
<td>5 (5)</td>
</tr>
<tr>
<td>Pancreatitis</td>
<td>7 (9)</td>
<td>1 (1)</td>
</tr>
</tbody>
</table>

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Results

Patient Population

• A total of 292 patients were screened for study inclusion, 113 patients met exclusion criteria leaving 79 patients in the BDG group and 100 patients in the T2MR group.

Patient Population

Estimated T2MR PPV 1

Percent of T2MR Population*

ICU Admission: 31%

Patient With Septic Shock and ICU 3-7 days: 62% 33%

Clinical Prediction score for candidemia: 82% 19%

Safety Endpoints

Subsequent Candidemia

BDG

T2MR

Proportion of the T2MR study arm meeting different IC risk strata and the corresponding PPV of T2MR testing

Factors Associated with Early Discontinuation of AFG

Subgroup Early discontinuation (n=91) Continuation (n=88) UnadjOR (95%CI)

T2MR

59 (65) 41 (47) 2.1 (1.2 - 3.9)

BDG

74 (81) 70 (79) 1.1 (0.5 - 2.3)

Vasopressors on initiation

45 (50) 50 (57) 0.7 (0.4 - 1.3)

Candida score ≥ 3

35 (39) 40 (46) 0.8 (0.4 - 1.4)

Are we testing the right patients?

Discontinuation of AFG

In BDG arm, 42% of patients had AFG empirically discontinued prior to test result

Summary

• T2MR testing facilitates use of early preemptive echinocandin therapy in ICU patients and minimizes unnecessary prolonged therapy when compared to use of BDG.

• Saving only 1 day of echinocandin therapy calls into question the cost-benefit utility of T2MR testing.

• Future stewardship efforts must focus on limiting T2MR testing in patient populations with a low positive predicted value.

The authors have no conflicts of interest to disclose relevant to this project.

References


Statistical Analysis

• Continuous variables were described as median (IQR) while categorical variables were presented as number (percent).

• Continuous endpoint was analyzed using the Mann-Whitney U test and categorical variables were compared using Chi-squared test with a p value < 0.05.

• A bivariate analysis was conducted for factors associated with early discontinuation of AFG therapy (1 day of AFG therapy).

• Discontinuation of AFG therapy was considered the primary endpoint.

• A total of 292 patients were screened for study inclusion, 113 patients met exclusion criteria leaving 79 patients in the BDG group and 100 patients in the T2MR group.

• The purpose of this study was to compare the duration of preemptive anidulafungin (AFG) therapy and outcomes following a negative T2MR or BDG test result among intensive care unit (ICU) patients.

• The primary endpoint is duration of preemptive AFG therapy (days).

• Secondary endpoints include proportion of patients restarted on antifungal therapy after discontinuation of index course, subsequent candidemia, and inpatient mortality.

• The study was an IRB-approved, retrospective, quasi-experiment in a four hospital system conducted before and after T2MR implementation.

• Patients were eligible for inclusion if they were admitted to an ICU, received AFG therapy, and had a negative RDT between May 2014-Oct 2017. T2MR testing was implemented in Nov 2015.

• Data collected using electronic medical records and standardized case report form.

• Descriptive measures (incidence, proportions, measures of central tendency and dispersion) were used to evaluate patient characteristics, indications, microbiologic data.

• Continuous variables were described as median (IQR) while categorical variables were presented as number (percent).

• Continuous endpoint was analyzed using the Mann-Whitney U test and categorical variables were compared using Chi-squared test with a p value < 0.05.

• A bivariate analysis was conducted for factors associated with early discontinuation of AFG therapy (1 day of AFG therapy).

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