

A Review of Echinocandin Use at Srinagarind Hospital

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Background and objective: Echinocandins are recommended antifungals for treating invasive fungal infection including candidemia and aspergillosis. They have been included in Srinagarind Hospital Formulary since 2006. However, the contemporary rates and pattern of usage have not been studied. This study aimed to evaluate the volume and usage pattern of echinocandin antifungals at Srinagarind Hospital.

Methods: This study used hospital pharmacy database and patient medical records to collect information on adult inpatient receiving echinocandin antifungals from 2006 to 2012.

Results: Thirty-five patients receiving echinocandins were retrospectively reviewed. Echinocandins were

prescribed for treating invasive fungal infection in 33 cases (94.3%). Uses of echinocandins were classified as empiric therapy 8 cases (22.9%), document therapy 7 cases (20%) and salvage therapy 20 cases (57.1%). The duration of echinocandin therapy were mostly less than two week (88.6%). Patients were discharged with improvement 10 cases (28.6%), non-improvement 9 cases (25.7%) and death 16 cases (45.7%).

Conclusions: Use of echinocandins mostly complied with the recommendation in term of indication, and dosage regimen. However, the response of treatment was mostly non-favorable.

Keywords: Echinocandins, Drug use review

ศรีนครินทร์เวชสาร 2558; 30 (suppl): . ♦ Srinagarind Med J 2015; 30 (suppl): .

Introduction

Echinocandins are semi-synthetic compounds that are currently licensed for treating fungal infection resistant to other antifungal classes. They have fungicidal and fungistatic activity against *Candida* and *Aspergillus*, respectively, which are usually the causative microbe of invasive fungal infection in hospitalized patients especially patients with immune deficiencies¹⁻³. In Thailand, echinocandins are very expensive drugs and still not included in National List of Essential Drug (NED) and drug fee can be compensated only when the essential drug cannot be applied to some individual case due to the medical reason limitation. Echinocandin antifungals including caspofungin, micafungin and anidulafungin have been

included in Srinagarind Hospital Formulary since 2006. The medical staffs must provide antimicrobial order form with certificate reason for individual case before getting permission for using from the hospital director. Review of echinocandin antifungals use would be a practice tool according to the control measure which will support the rationale of drug utilization.

Objective

The purposed of study was to evaluate the usage patterns of echinocandin antifungals at Srinagarind Hospital in terms of prescribing volume, indication, dosage regimen and duration of therapy.



Methods

The study protocol was approved by the institutional research ethics committee of Khon Kaen university (HE551238). Data were collected from hospital pharmacy database and patient medical record on adult inpatient over 18 year old receiving caspofungin, micafungin or anidulafungin at Srinagarind Hospital from 2006 to 2012. Prescribing volume of echinocandin antifungal was assessed and calculated in terms of amount and drug cost using hospital pharmacy database. The indication, dosage regimen and duration of therapy were assessed by reviewing the patient medical record. Other data including type of therapy and discharge status were also collected. All data were analyzed quantitatively using descriptive statistics as the number or frequency and percentage.

Results

Echinocandin antifungals were used in 58 patients but only 35 patients were recruited into the study and 17 patients were males (48.6%). The average age of patients was 68.7 ± 12.8 years old. (Table 1) The total amounts of drug used were 231 vials and cost 1,867,226 Baht. They were mostly used as salvage therapy in 20 cases (57.1%) followed by empiric therapy in 8 cases (22.9%) and document therapy in 7 cases (20%). The drug dose was followed the recommendation in 29 cases (82.9%). The duration of therapy was between 1 and 18 days. (Table 2) Regarding to discharge status, improvement, non-improvement and death were indicated in 10 (28.6%), 9 (25.7%) and 16 (45.7%) cases, respectively.

Table 1 Patients' characteristics

Characteristics	Number of case (%)
Demographic data	
Male gender	17 (48.6%)
Age (years, mean \pm SD)	68.7 ± 12.8
Type of fungal infection	
Invasive infection	33 (94.3)
Septicaemia : Disseminated infection	27:6
Candidiasis : Aspergillosis : Both	27:5:1
Unidentified	2 (5.7)

Table 2 Usage pattern of echinocandin antifungals

Usage pattern	Number of case (%)
Type of therapy	
Empiric therapy	8 (22.9)
Document therapy	7 (20.0)
Salvage therapy	20 (57.1)
Type of echinocandin	
Caspofungin (171 vials; 1,474,704 baht)	28 (80.0)
Micafungin (13 vials; 46,696 baht)	2 (5.7)
Anidulafungin (47 vials; 345,826 baht)	5 (14.3)
Dosage regimen^a	
Comply with recommendation	29 (82.9)
Non-comply with recommendation	6 (17.1)
Duration of therapy	
<14 days	31 (88.6)
>14 days	4 (11.4)

^aCaspofungin (loading dose 70 mg and maintenance dose 50 mg every 24 h); Micafungin (100 mg every 24 h); Anidulafungin (loading dose 200 mg and maintenance dose 100 mg every 24 h)

Discussion

Use of echinocandin antifungals was complied with the institutional control measure. They were usually used as document therapy or salvage therapy, a type of treatment given after the patient does not respond to standard treatment of invasive fungal infection^{2,3}. The highest prescribing volume was contributed to caspofungin (80.0%) because it has been considered to be the first line agent for treatment of candidemia and has more consistent proof of clinical activity against than either micafungin or anidulafungin⁴. Moreover, the daily caspofungin cost was lower than the others. However, high unfavorable response was found as high as 70% of cases because invasive fungal infection is severe illness and patient may have some complication especially in case of salvage therapy⁵. The duration of therapy was also shorter than 14 days which was contributed to early drug discontinuation and correlated to non-improvement or death at discharge.

Conclusions

Use of echinocandins mostly complied with the recommendation in term of indication, and dosage

regimen over 80%. However, the favorable response defined as clinical improvement was found in only one-fourth of patient at discharge.

Acknowledgement

We thank Miss Pirunrat Chathaen and Miss Natpavee Odthon, Faculty of Pharmaceutical Sciences, KhonKaen University for their helpful in data collection.

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