Trends and Cost Analysis of Aspergillus Galactomannan Testing at UMMC

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INTRODUCTION

- *Aspergillus* is a fungus spread by inhalation of spores that can lead to invasive (IA), chronic, or allergic aspergillosis.
- Risk factors for IA include neutropenia, hematological malignancy, allogenic stem cell (HSCT) or solid organ transplant, severe immunodeficiency, or prolonged steroid use.
- The serum Galactomannan (AGM) test detects a polysaccharide cell wall component of *Aspergillus* and can be used to determine a probable diagnosis of IA.[1]
- Accuracy of AGM is related to disease burden and thus has the highest sensitivity and specificity in patients with hematologic malignancy or Hematopoietic stem cell transplantation (HSCT) at 70-82% and 86-92%, respectively. [2]
- Studies have shown sensitivity to decline in other populations, with solid organ transplants as low as 20%.

METHODS

- A retrospective study of all patients who received the AGM test at UMMC from January 3, 2013 to December 31, 2019. was performed .
- Patient Cohort Explorer was used to obtain de-identified patient data from EPIC.
- We obtained the number of encounters and patients on whom the AGM test was performed along with other variables.
- Billing offices provided the self-pay cost per AGM test.

RESULTS

Aspergillus Galactomannan Testing at UMMC from 2013-2019

Total Tests Performed	Total Patients Tested	Total patient encounters
6404	2126	4315

Numbers of Tests Performed by Year

2013	2014	2015	2016	2017	2018	2019
499	574	984	1140	851	1175	1181

- The patient's ages ranged from 1 to 89, with a median age of 52.
- 3,055 test were ordered in female patients, and 3,349 in male patients.
- The total self pay cost for each test was $134.54 (CPT code 87305)

Total Cost of Aspergillus Galactomannan Testing 2013-2019 at UMMC = 6,404 total tests x $134.54 = $861,594.16

Positive tests with >0.5 cut off value (optical density index)	Positive tests with >1.0 cut off value (optical density index)
183 (in 108 patients)	113 (in 70 patients)

- The rate of a positive AGM tests at > 0.5 was at 2.85% and at > 1.0 was at 1.76% over the study period.

CONCLUSIONS

- To our knowledge this data set constitutes the largest sample size of Aspergillus Galactomannan testing that has been studied to this point.
- From our hospital's data, there has been an essentially upward trend in the ordering of this test yearly.
- Relatively low percentage of these tests are positive, suggesting that it is most likely a large amount of these tests could have been ordered inappropriately or in the wrong clinical context.
- Large amounts of hospital funds have been spent on this test most likely in an inappropriate clinical context, costing both patients and the hospital an unnecessary amount.

FUTURE INVESTIGATIONS

- Future investigations include analysis of specific locations(i.e. floors of the hospital and specific clinics) and clinical contexts the tests were ordered, which could shed more light on if these tests were ordered appropriately in the right clinical population.
- After analyzing this data, there are also opportunities for several quality improvement projects, one specifically being resident/program education regarding the correct clinical context these tests should be ordered in with follow up on the number of tests ordered by these services

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