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Potential Impact of Choosing Wisely-- ED Coagulation Study (PT-PTT-INR): Utilization and Economic Modeling

ABSTRACT

Purpose of the study: The purpose of this study was to look at ED compliance with the Schuur et al, Choosing Wisely recommendations for ED coagulation study utilization and to create an economic model for the relationship of specific reasons for coagulation testing in the ED to potential savings.

Materials and Methods: The setting was the three emergency departments of a community-based, university-affiliated hospital system. The study design was a retrospective chart review utilizing data from laboratory and emergency departments. One hundred charts in which a PT/INR and or PTT had been ordered were randomly selected. Laboratory data included specific costs of the tests and the overall number of tests ordered for years 2015 and 2016. An economic model for system-wide and national potential savings was created based on the resulting utilization data.

Results: The overall compliance of coagulation utilization with the Choosing Wisely recommendation was 27%. Inversely, the overall non-compliance of coagulation utilization was 73%. There were no cases in which there was a clinically significant abnormal coagulation result. The system average for utilization of PT/INR for the two years studied was 28%. The system average for utilization of PTT for the two years studied was 27%. There was some variation by campus. For PT/INR the range was 24% to 30%. For PTT the range was 23% to 29%.

Economic Modeling Results: 3 hospital system model. The 3 hospital system charge for a PT/INR is \$53.00 The 3 hospital system charge for a PTT is \$64.00 Using the base year, the total charge for PT/INR testing was approximately 2.3 million dollars and the total charge for PTT testing was approximately 2.7 million dollars. **PT/INR potential savings:** A 10% reduction in PT/INR use translates to over 230,000 dollars in savings. A 20% reduction is double that—approximately 460,000 dollars. If the maximal overutilization rate of 73% was decreased to a minimum, the savings would be over 1.6 million dollars. **PTT potential savings:** A 10% reduction in PTT could save over 270,000 dollars in savings. A 20% reduction is double that—approximately 540,000 dollars. If the maximal overutilization rate of 73% was decreased to a minimum, the savings would be over 1.9 million dollars.

Economic Modeling Results: National model. Exact national data for coagulation use is not readily available. However, some modeling is possible given the assumptions of the system rates of 28% utilization of PT/INR and 27% PTT, as well as the system charges applied into the model. As a model, based on CDC data from the index year (136 million ED visits) the results

can be calculated as an estimation. **National potential PT/INR savings:** A 10% reduction in PT/INR use nationally translates to over 200 million dollars in national savings. A 20% reduction is double that—approximately 400 million dollars. **National potential PTT savings:** A 10% reduction in PTT use nationally translates to over 246 million dollars in national savings. A 20% reduction is double that—approximately 490 million dollars.

Conclusions: The overall compliance of coagulation utilization with the Choosing Wisely recommendations was 27%. Inversely, the overall non-compliance of coagulation utilization with the Choosing Wisely recommendations was 73%. The economic model strongly suggests that ordering coagulation studies in the ED using the Choosing Wisely recommendations could result in decreased utilization without clinical harm to patients and could translate into significant local and national savings.

KEYWORDS: Coagulation study utilization; Emergency medicine laboratory utilization; Choosing Wisely in emergency medicine; Emergency medicine laboratory utilization economic modeling

INTRODUCTION

Schuur et al addressed the problem of rising costs in healthcare and made specific recommendations to reduce costs in emergency medicine practices. The article noted that “the mean cost of medical care in the United States is growing at an unsustainable rate; from 2003 through 2011, the cost of an emergency department visit rose 240%, from \$560 to \$1,354. The diagnostic tests, treatments and hospitalizations that emergency clinicians order result in significant cost” [1]. The authors published a “Top-Five” list of low-value clinical action for emergency medicine practices. The list was an emergency medicine outgrowth of the from “Choosing Wisely” process first initiated by the American Board of Internal Medicine Foundation [2]. The ED “top five list” was developed by an expert panel with inputs from multiple sources, to reduce the cost of emergency medicine care. The list included “not ordering coagulation studies without clinical coagulopathic concerns.” This was the only laboratory test on this list. The other four items related to radiology studies. We looked at data from three emergency departments of a community-based, university-affiliated hospital system and looked at compliance with Schuur et al Choosing Wisely recommendations on coagulation study utilization. We then extrapolated an economic model, addressing the financial impact of unnecessary coagulation testing across the three emergency departments with a national savings economic estimate.

MATERIALS AND METHODS

The setting was the three emergency departments of a community-based, university-affiliated hospital system. The study design was a retrospective chart review utilizing data from laboratory and emergency departments. One hundred charts in which a PT/INR and or PTT had been ordered were randomly selected. Laboratory data included specific costs of the tests and the overall number of tests ordered for years 2015 and 2016. Inclusion criteria included patients greater than 18 years of age, in which a PT/INR and or PTT had been ordered. Patients less than 18 years of age were excluded. The study was approved by the Investigational Review Board (IRB). An economic model for system-wide and national potential savings was created based on the resulting utilization data.

RESULTS

Compliance with choosing wisely recommendations

27% of the patients studied met compliance under the Choosing Wisely coagulation test recommendation. Inversely, the overall non-compliance was 73%.

When applying the Choosing Wisely recommendation there were no cases in which clinically significant abnormal coagulation studies, resulted.

Utilization: 3 hospital system model

The system average for utilization of PT/INR for the two years studied was 28%. The system average for utilization of PTT for the two years studied was 27%. There was some variation by campus. For PT/INR the range was 24% to 30%. For PTT the range was 23% to 29%. It is not known how these data compare regionally or nationally.

Economic Modeling Results: 3 hospital system model

The 3 hospital system charge for a PT/INR was \$53.00. The 3 hospital system charge for a PTT was \$64.00. Using the base year, the total charge for PT/INR testing was approximately 2.3 million dollars and the total charge for PTT testing was approximately 2.7 million dollars.

PT/INR potential savings

A 10% reduction in PT/INR use translates to over 230,000 dollars in savings. A 20% reduction is double that—approximately 460,000 dollars. If the overutilization rate of 73% were decreased to a minimum the potential savings would approach 1.6 million dollars.

PTT potential savings

A 10% reduction in PTT could save over 270,000 dollars in savings. A 20% reduction would therefore be approximately 540,000 dollars. If the overutilization rate of 73% were decreased to a minimum, the potential savings would be over 1.9 million dollars.

Economic Modeling Results: National model

National data for coagulation test use is not readily available. However, some modeling is possible given the assumptions of the system rates of 28% utilization of PT/INR and 27% PTT, as well as the system charges applied into the model. As a model, based on Center for Disease control (CDC) data from the index year (136 million ED visits) the results can be calculated as an estimation.

National potential PT/INR savings

A 10% reduction in PT/INR use nationally translates to over 200 million dollars in national savings. A 20% reduction is double that—approximately 400 million dollars.

National potential PTT/INR

A 10% reduction in PTT use nationally translates to over 246 million dollars in national savings. A 20% reduction is double that—approximately 490 million dollars.

DISCUSSION

Compliance and noncompliance with Choosing Wisely

The overall compliance of coagulation utilization with the Choosing Wisely recommendations was 27%. Inversely, the overall non-compliance was 73%. There were no cases in which there was a clinically significant abnormal coagulation would have resulted from applying the Choosing Wisely recommendation.

Economic Modeling

The key results suggest that decreases in the overutilization of coagulation studies, could translate into significant national savings. The exact utilization rate nationally is unclear—local rates were applied to national data in the model. Hence potential national savings can only be estimated, at this time.

CONCLUSIONS

Our study looked at ED compliance with the Schuur et al Choosing Wisely recommendations for ED coagulation utilization and created an economic model for potential savings. The overall compliance of coagulation utilization with the Choosing Wisely recommendations was 27%. Inversely, the overall non-compliance was 73%. When applying the Choosing Wisely recommendation there were no cases in which clinically significant abnormal coagulation studies, resulted. The key economic model strongly suggests that ordering coagulation studies in the ED using the Choosing Wisely recommendations could result in decreased utilization without clinical harm to patients and could translate into significant local and national savings for an already financially burdened healthcare system. It appears that there can be a significant positive financial impact on cost of both local and national emergency medicine with implementation of the Choose Wisely recommendation for ordering PT/INR and PTT.

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