PHARMACEUTICAL ALGORITHMS TARGETING ANTITHROMBOTIC THERAPY: IMPACT OF AVICENNE CLINICAL DECISION SUPPORT IN PATIENT SAFETY

a.potier@chru-nancy.fr

[1]Hospital center of Lunéville 54300 LUNEVILLE France
[2]University hospital center of Nancy 54000 NANCY France
[3]University of Lorraine, APEMAC 54000 NANCY France
[4]K-team LORIA 54000 NANCY France

A Potier[1,2] , E Dufay[1], A Dony[1], E Divoux[1], C Isernia[2], L-A Arnoux[2], E Boschetti[2], D Piney[1], N Jay[4], B Demoré [2]

Background

Anticoagulants are sources of iatrogenia when they are used, misused or not use, especially when medication errors are involved.

The EAHP statement integrates pharmaceutical analysis into our practices mentioning that all prescriptions should be reviewed and validated as soon as possible by a pharmacist. Pharmaceutical analysis practice is highly variable.

Clinical decision support systems have globally proven to be effective in reducing morbidity, improving the Drug Related Problems (DRP) detection and reducing adverse drug events and costs.

The Threefold Alliance AVICENNE as a real time clinical decision support system works on the patient's data, Pharmaceutical Algorithms (PA) and Pharmaclass® (Keenturtle - F).

Aim

This study aims to present AVICENNE ability to detect drug-related problems (DRP) when working on antithrombotic therapy compared to other drugs.

Materials and methods

An observational prospective study has been ongoing from January 2019 to September 2020 in 2 facilities (1600 beds).

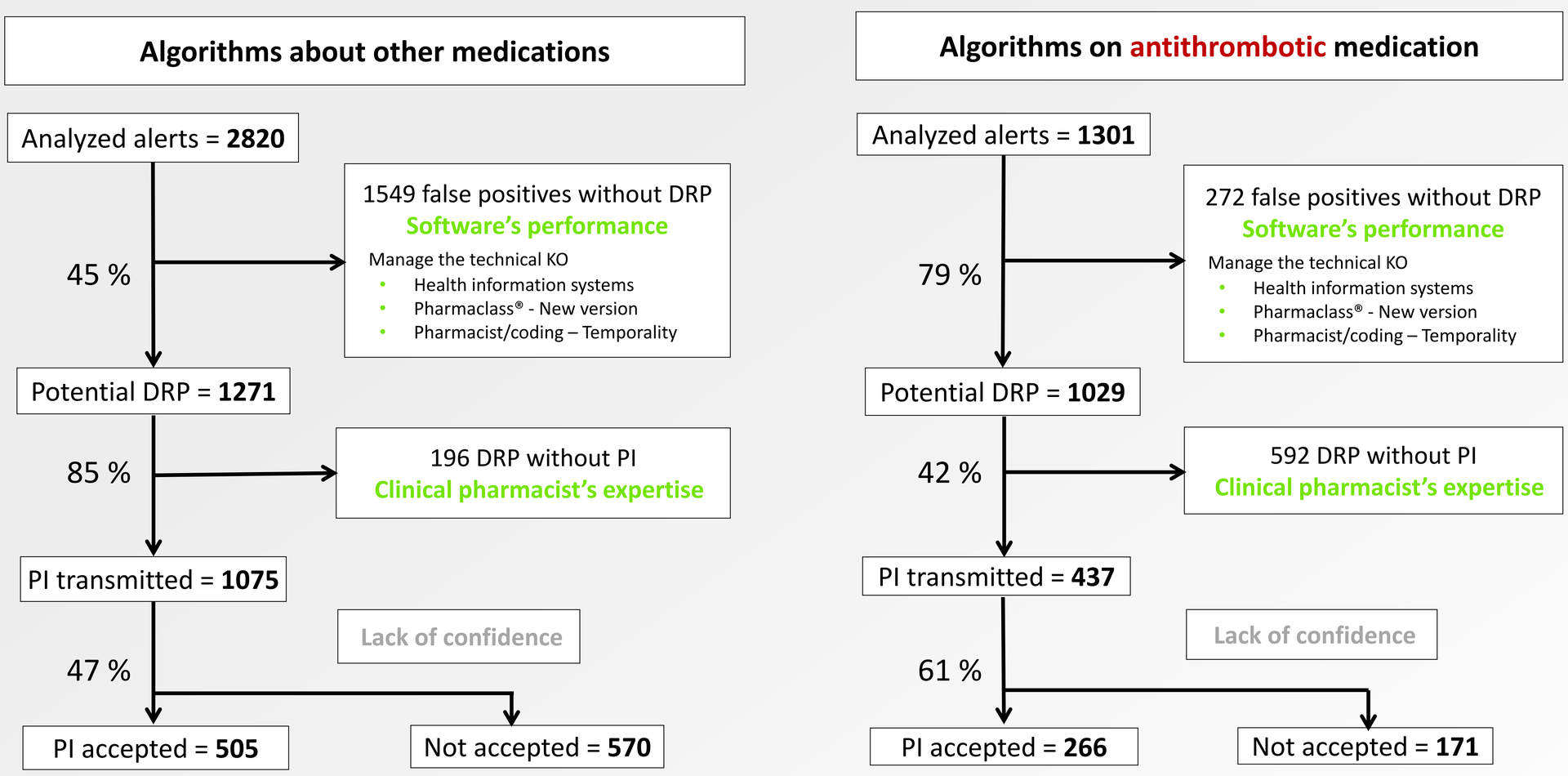
Twenty-three about 135 pharmaceutical algorithms encoded in Pharmaclass® detected patients with an antithrombotic related problem.
Guidelines structure the pharmaceutical analysis of selected DRPs analyzed from anamnesis to Pharmaceutical Interventions' transmission (PI).

- Heparin induced thrombopenia Side effect Hemorrhage Thrombosis
- Unfractionnated heparin & GFR > 30 mL/min No-compliance with standards Hemorrhage
- Unfractionnated heparin overdosing Hemorrhage
- Heparinotherapy and obesity Drug Underdosing Thromboembolic event
- Unfractionnated heparin Underdosing Thrombosis
- Low molecular weight heparin & renal insufficiency Contraindication Hemorrhage
- Low molecular weight heparin Overdosing Hemorrhage
- Prophylactic anticoagulation under Low molecular weight heparin & thin patient Overdosing Hemorrhage
- Curative anticoagulation & Intramuscular injection Inappropriate route of administration Hemorrhage
- Direct anticoagulant & renal insufficiency Contraindication Hemorrhage
- Direct anticoagulant & Heparin Contraindication Hemorrhage
- Miconazol & Direct anticoagulant Drug interaction Hemorrhage
- Xaban Drug interaction Hemorrhage
- Apixaban risk factors Overdosing Hemorrhage
- Apixaban Underdosing Thromboembolic event
- Rivaroxaban Overdosing Hemorrhage
- Dabigatran risk factors Overdosing Hemorrhage
- VKA & INR > 4.0 Overdosing Hemorrhage
- Ticagrelor or Prasugrel & Aspirin Untreated indication Thrombosis
- Anticoagulant or Antiplatelets Severe thrombopenia Contraindication Hemorrhage
- Anticoagulant and antiarrhythmic drug underdosing Inefficiency
- Heparin & VKA Drug not indicated Hemorrhage
- Direct anticoagulant & VKA Drug interaction Hemorrhage

In the 2 algorithms' sets the number of accepted PIs is collected via computerized patient order entries.

Results

The data are collected during 260 non-consecutive days. On 4121 alerts 1301 were about anticoagulant medications (31%) and 2820 about other medications (69%). DRP detection is better performed with algorithms' on anticoagulants than with the other one (1029 [79%] vs 1271 [45%]), because of fewer technical false positives.



Pharmacist issued 437 PI targeting antithrombotic medicines of which 266 PI (61%) were accepted by physician. On the other hand 1075 transmitted PI have resulted in 505 accepted PI (47%). The difference is statistically significant ($X^2=23.99$; $p<10^{-6}$). For both of the algorithms' sets the transmission way has the same importance: for the oral way, respectively 29% vs 27% (NS). And the acceptance rate is similar with 81% and 75% respectively (NS).

Conclusion

Algorithms about antithrombotic therapy medications are more efficient in the DRP detection because of explicit clinical practice' guidelines.
The acceptance rate of PI by physicians is better.
AVICENNE improves patient safety.

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