Santé Publique SPIM Informatique Médicale

Inserm UMRS 872 eq 20

HEGP Hôpital Européen Georges Pompidou

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Decision support for the prescription of hepatitis B virus tests in cardiovascular surgery

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Introduction

- Computerized Decision Support Systems (especially alerts and active reminders) could improve the quality of care and/or hospital practices [Garg 2005].

- However, some problems remain with the implementation of such systems in routine practice and with the accessibility of such systems to doctors [Aarts 2004].

Introduction

- During 2005, 13% of the hepatitis B virus (HBV) tests prescribed by the Cardiovascular Surgery Department at the European Georges Pompidou Hospital were ordered less than 30 days after the previous test result for the same patient.

- An active reminder system concerning the repeated prescription of HBV tests in this department was implemented as a mean of decreasing this repetition.

Materials and Methods: Intervention

- HBV alerts
  - are displayed as a new page (in the EHR) concomitant with the prescription window,
  - appear at the moment of a HBV test is selected to be prescribed,
  - contain the date and complete result for the most recent last HBV test carried out for the patient (obtained less than 30 days previously).

- Alerts traceability to reflect
  - the selection of HBV test for ordering,
  - the display of any alert,
  - the time elapsed between any previous result and these events.

Materials and Methods: Impact

- **Indicator:**

  Proportion of all HBV results repeated within an interval of less than 30 days (RT_{30})

- **Method of analysis:**

  Impact of the intervention on practices is evaluated by an interrupted time series of two-month periods
  - "before intervention": Jan 04 - Jun 06 (9 pts)
  - "after intervention" :Jul 06 - Dec 07 (5 pts)

- **Data collection:**

  Indicator estimated from HBV results extracted from the EHR database

Materials and Methods: Compliance

- **Indicator:**

  Proportion of all intentions to order a repeated test within 30 days of the last one (RTI_{30})

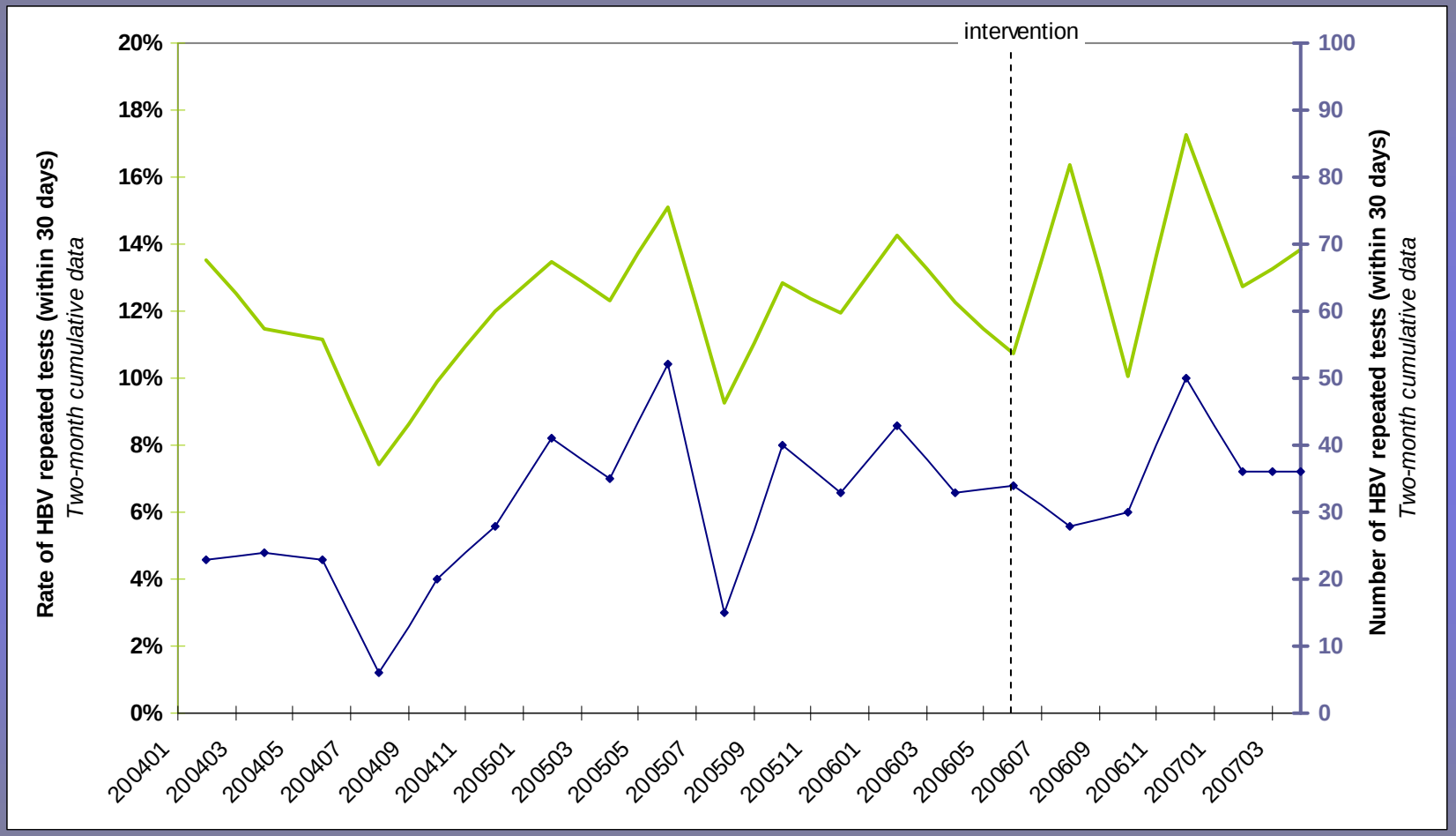
- **Method of analysis:**

  Compliance with the alert is evaluated by comparing RT_{30} and RTI_{30} during the after intervention period

- **Data collection:**

  Indicator estimated from traces extracted from the decision support system database

Results: Impact of the intervention



Wilcoxon rank-sum test

- no significant change in rates after intervention
- p-value=0.11

Results: Compliance with the alert

- 1,430 intents to prescribe
- 165 (11.5%) intents to prescribe within 30 days after a previous HBV test result
- Interval between the previous test and the repeated test: median 123 days (interquartile range 26.75 - 287)
- 8.3% of compliance with the alert

Discussion

- Alert successfully implemented
- Data extraction from EHR database make possible decision support evaluation
- But the intervention seem to have no effect on the HBV tests repetition
- Disappointing results because this CDSS provides features of interest [Kawamoto 2005]
  - Automatic provision of decision support as part of clinician workflow
  - Provision of decision support at time and location of decision making
  - Promotion of action rather than inaction

Discussion

- Ambiguous source of knowledge used to provide the support?
  - no fully acknowledged delay exists for repletion of serology
  - 30 days-delay decided with the collaboration of one clinician and a virologist, probably not sufficient to warrant a consensus of all prescribers
- Next alert (HbA1C) based on incontestable arguments
  - indicated for diabetics patients follow-up
  - 3 months-delay of repletion due to HbA1C kinetic physiology

Conclusion

- The capacity of a computerized prescription system to alert the doctor to the unnecessary repetition of examinations and potential prescription errors is one of the characteristics included in evaluations of the quality of such a system [Kilbridge 2006].
- However, although this type of intervention is generally effective [Garg 2005], the implementation of alerts and the evaluation of their impact must be adapted to the local context.
- Indeed, it remains to be demonstrated that alerts are effective regardless of the context in which they occur.

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Acknoledgements

This project was funded by a CIFRE grant from MEDASYS (Julie Niès).

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