HOSPITAL DISCHARGE DATABASE FOR SSI SURVEILLANCE AFTER HIP OR KNEE ARTHROPLASTY (HKA)

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Introduction

Surgical site infections (SSI) surveillance, key method of nosocomial infection control systems, is often considered to be poorly cost-effective.
The study aims to assess the efficacy of using the hospital discharge database (HDD) as a routine surveillance system for detecting hip or knee arthroplasty-related infections (HKAI).

Materials and Methods

Retrospective cohort study of HKA was built in one French region (2.5 M inhab), using HDD 2008-10: stays with HKA code + corresponding prosthetic material in 2008-09, with linkage to patients due to the anonymous patient number. HD were analysed until the end of 2010.

• Case-control study nested in the cohort of HKA patients hospitalized between 2008 and 2010:

- Cases = HKAI according to various HD algorithms using the ICD-10 and procedure codes from the HD resumes (Table 1)

- Controls = HKA without infection, selected at random in the HD cohort of HKA during 2008-10 period (Fig. 1)

• The gold standard was defined according to the review of medical charts => Sensitivity (Se), Specificity (Spe), positive predictive value (PPV) and negative predictive value (NPV) were calculated to evaluate the efficacy of the surveillance system.

Table I - HKAI Case Definition

Level of Proof	Primary Diagnosis	Secondary Diagnosis	Procedure's code
A	Sepsis/BJI	Specific T code	-
	-	Specific T code + Sepsis/BJI	-
	-	Specific T code	Specific PJI surgical procedures
	Specific T code *(coding mistake)*	Sepsis/BJI	-
	Specific T code *(coding mistake)*	-	Specific PJI surgical procedures
	-	Sepsis/BJI	Specific PJI surgical procedures
	Sepsis/BJI	-	Specific PJI surgical procedures
B	-	Unspecific T code + Infection	-
	Sepsis/BJI	Unspecific T code	-
	-	Unspecific T code	Specific PJI surgical procedures
C	-	Specific T code	-
	Specific T code *(coding mistake)*	-	-
	-	-	Specific PJI surgical procedures
	-	Unspecific T code	-
	Unspecific T code *(coding mistake)*	-	-

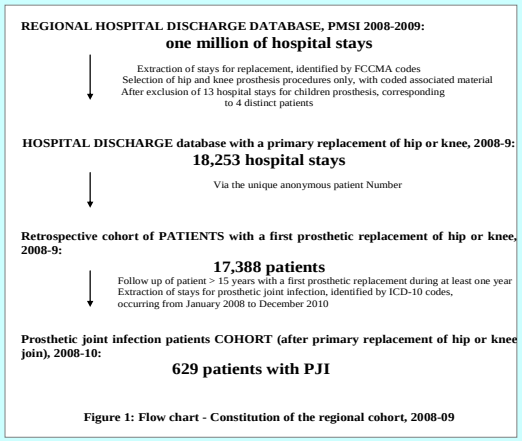

Figure 1: Flow chart - Constitution of the regional cohort, 2008-09

Results

• 18,265 hospital stays for HKA (1.8% of hospitalisation, 17,388 patients)

• Validation sample of medical reports = 1,010 hospital stays (989 patients) (Fig. 2)

• 530 HD cases were identified (incidence rate: 1%, $_{95\%}$CI 0.4%-1.6%)

• With 333 true cases compared to 480 controls, parameters of efficiency were:

- **Se 98%, Spe 71%, PPV 63%, NPV 99%**

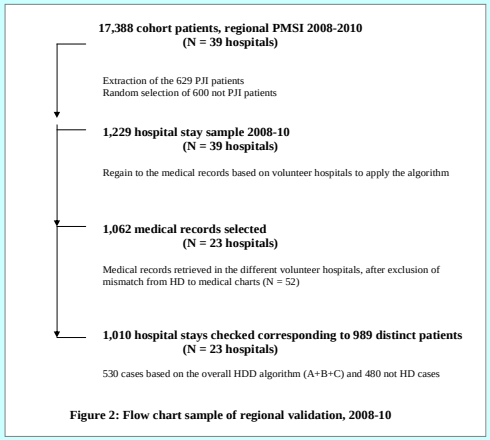

Figure 2: Flow chart sample of regional validation, 2008-10

• Using more specific case definition, based on a sample of 681 hospital stays and 201 cases:

- **Se 97%, Spe 95%, PPV 87%, NPV 98%** (Table II)

Table II: Estimation of sensitivity, specificity, predictive positive value and predictive negative value of the different case definitions of PJI proposed (N= 1,010)

Sample of validation (N)	True positive cases N (%)	False positive cases N (%)	Sensitivity % [95% CI]	Specificity % [95% CI]	PPV % [95% CI]	PNV % [95% CI]
Definition A (681)	174 (25.6)	27 (4.0)	97 [95.7-98.3]	95 [93.4-96.6]	87 [84.5-89.5]	98 [96.9-99.1]
Definition A+B (821)	246 (30.0)	75 (9.1)	98 [97.0-99.0]	83 [80.4-85.6]	72 [68.9-75.1]	99 [98.3-99.7]
Definition A+B+C (1,010)	333 (33.0)	197 (19.5)	98 [97.1-98.9]	71 [67.8-73.4]	63 [59.8-65.8]	99 [98.1-99.5]

Conclusion

This study demonstrates the potential of HDD for routine SSI surveillance in low-risk surgery, under conditions of having an appropriate validated algorithm for selecting infections.

References

L. Grammatico-Guillon, S. Baron, C. Gaborit, E. Rusch, P. Astagneau. *Quality assessment of hospital discharge database for routine surveillance of hip and knee arthroplasty-related infections. Inf Control Hosp Epid 2014. In press*

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