

Investigation of a cluster of nosocomial HBV-infections in Sweden -obstacles and efforts

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Nosocomial HBV-infections in Sweden I: Patients 1991-2002

1991-96

12 cases

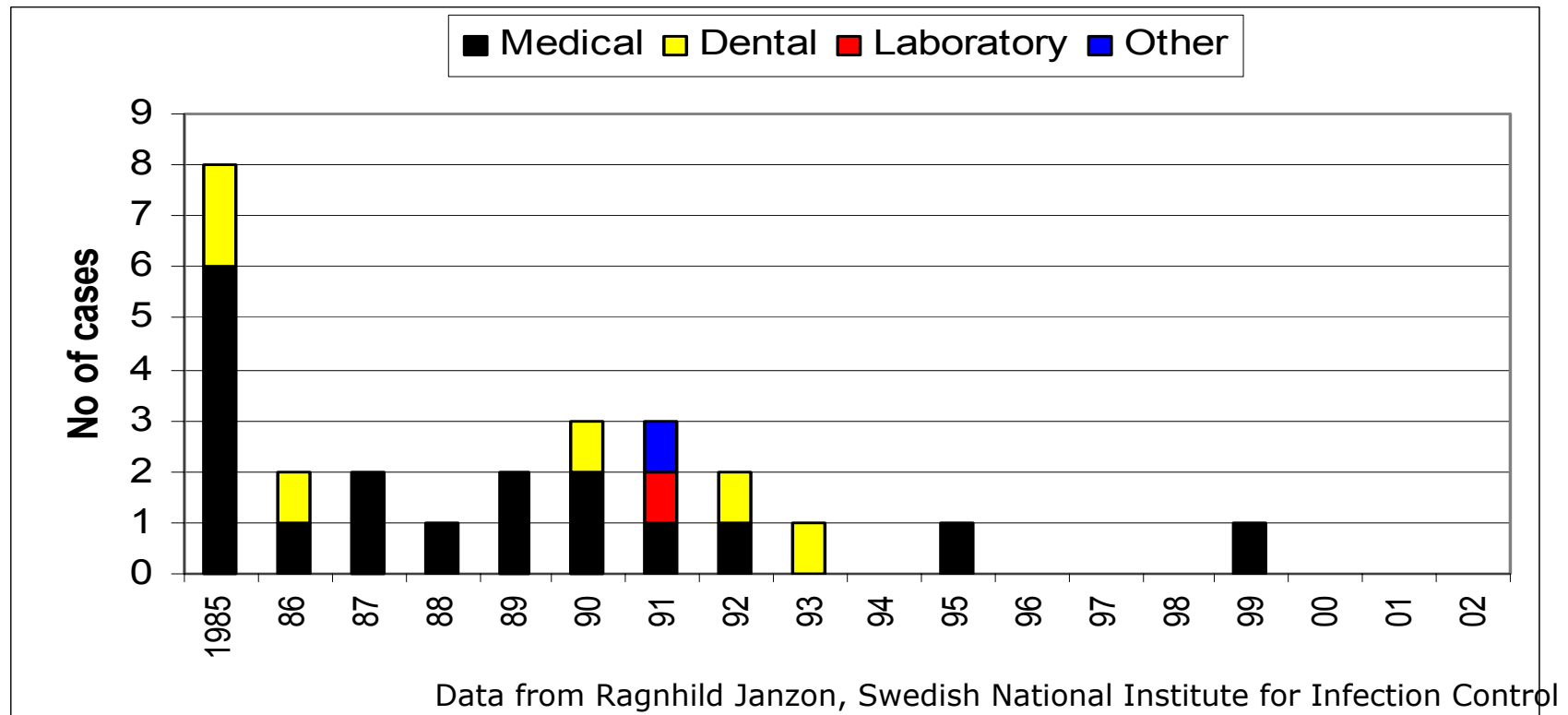
1997-2002

3 "blood"

2 "other nosocomial"

Data from Ragnhild Janzon, Swedish National Institute for Infection Control

Nosocomial HBV-infections in Sweden II: Staff



So – why bother ?

Cases at Huddinge University Hospital

1. November 1999
75-year-old male, end-stage renal disease, recent shift from PD to HD after peritonitis
2. March 2000
34-year-old male with Burkitt lymphoma
3. August 2000
57-year-old male with coronary heart disease
4. August 2000
18-year-old male with malignant lymphoma

Considerations

Identification of possible source(s)

Avoid further transmission

- Detect new (silent) cases
- Review infection control practises

Case # 1

A known HBV-positive dialysis patient ?

Blood ?

Unrecognised dialysis-/other patient ?

More cases ?

Case # 2

Same blood donor as # 1 ?

Thai wife ?

Unrecognised patient in hematology ?

Case # 3

No blood transfusion

No treatment in same clinics as #1 and #2

Isolated case...?

Case # 4

Treated at same clinic as # 2 during overlapping period, however not even blood sampling during same day

Same blood donor as # 1 and/or #2?

What we tried to do...

To find the source:

- Regular contact tracing among sexual partners, family members etc
- Rule out common blood-donors
- Identify seroconverted blood-donors
- Identify HBV-DNA positive dialysis patients
- Sequence HBV-DNA positive cases and possible sources

To identify new cases:

- Intensified surveillance of dialysis patients

Prevention:

- Vaccination of unvaccinated staff
- Review of infection control practices

What we didn't do ...

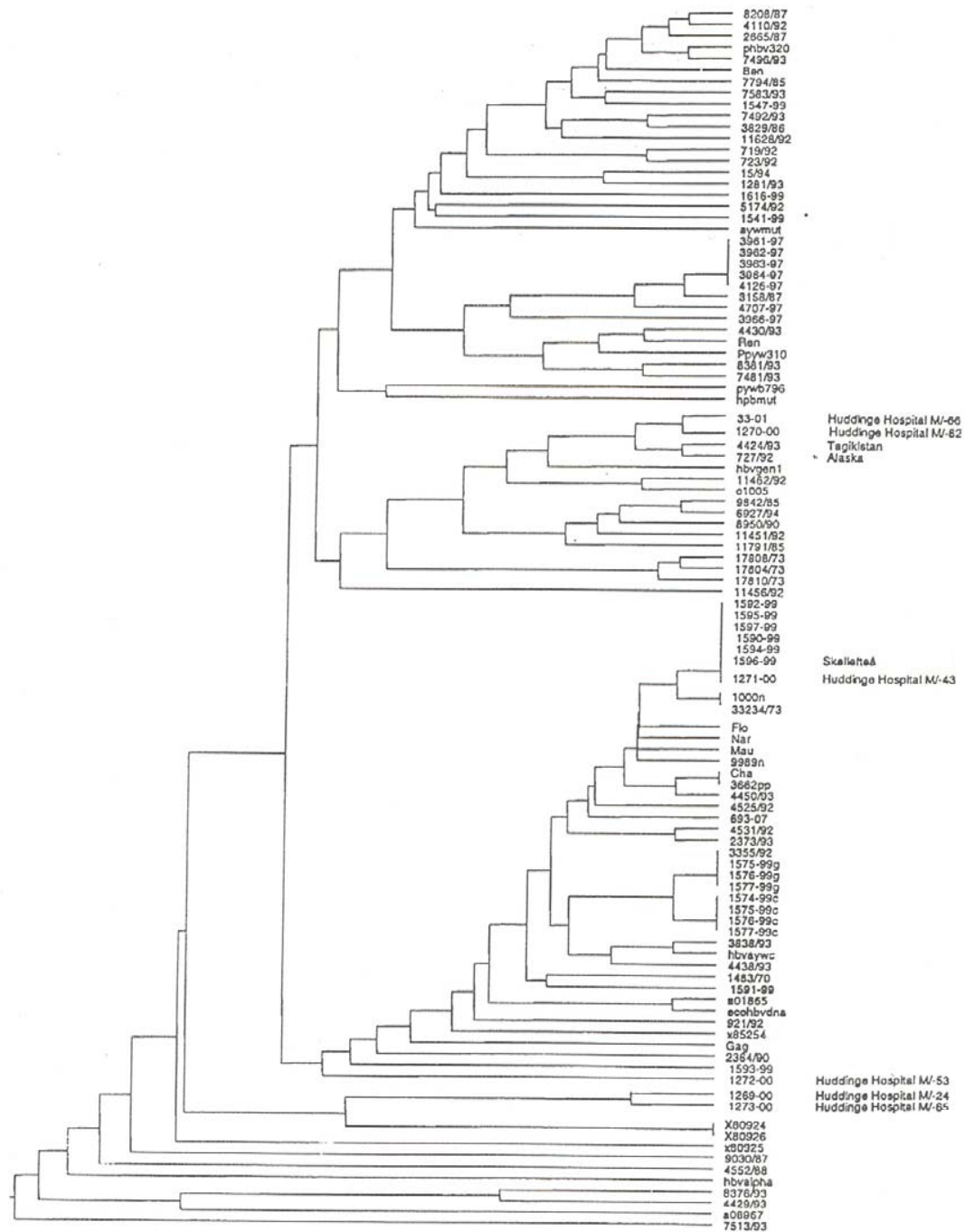
Staff ?

Other patients ?

Outcome of source-hunting I

- Thai wife HBsAg positive (others negative)
- No common blood-donor
- 8/8 anti-HBc positive dialysis patients anti-HBc IgM and HBV-DNA negative
- 2/4 known HBsAg positive dialysis patients HBV-DNA positive

Results from sequencing...



0.01

Conclusion

Two coupled pairs (with one secondary case)

How ?

One isolated case

Typing useful for confirmation of related cases as well as
excluding non-related cases

End of story ?

Case # 5 February -02

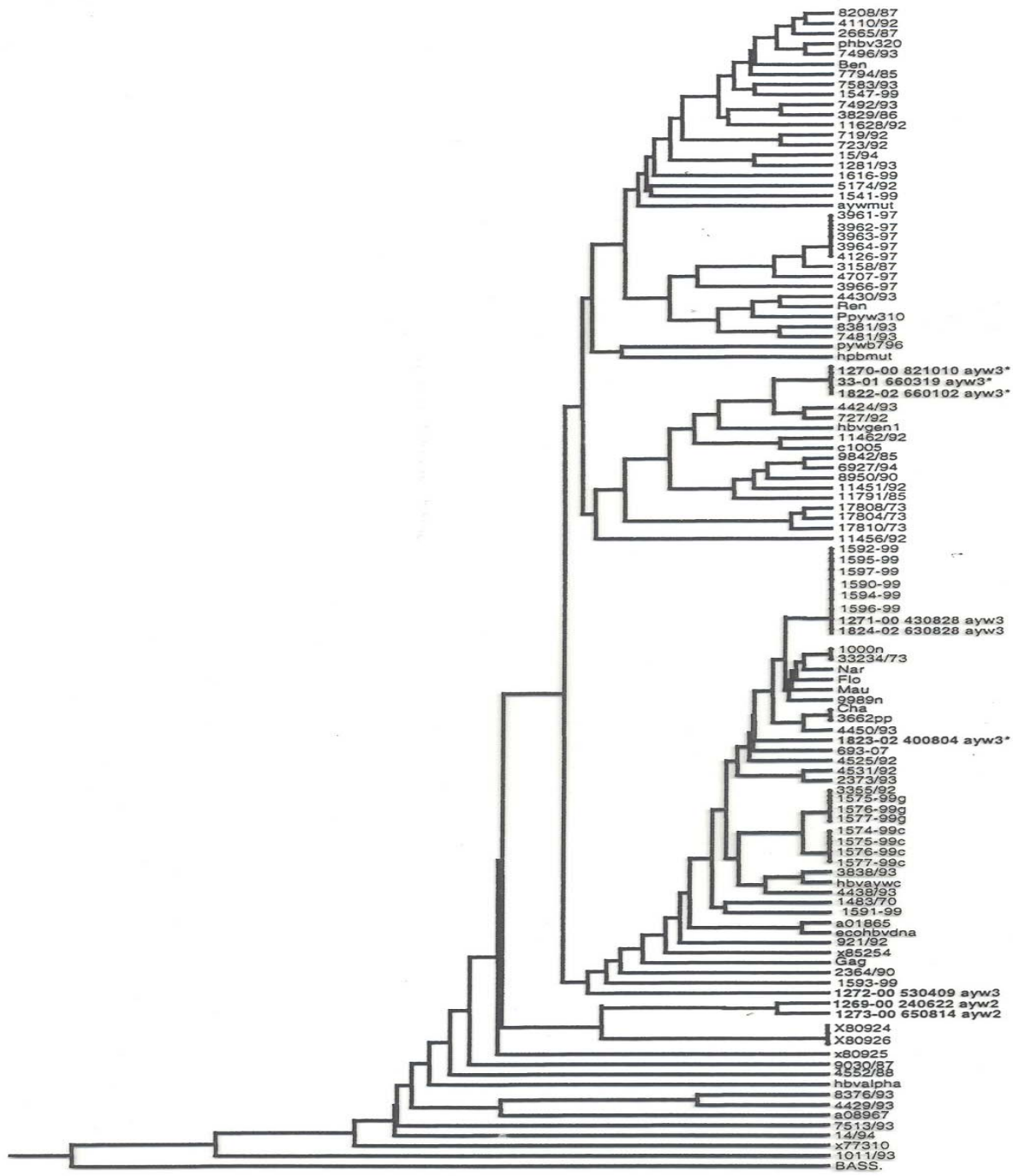
47-year old male with ALL, seronegative 2000,
diagnosed having activated chronic HBV

meanwhile....

Eureka !

35-year old woman with acute HBV

Father 60 years old, coronary heart disease



Consequences at the individual level

- 1/5 patients died from liver failure
- 1/5 patients developed chronic infection and cirrhosis within 2 years, furthermore, he infected his wife
- 1/5 patients felt terrible about not knowing how he was infected
- 1/5 patients died from his underlying disease
- 1/5 chronic infection which cleared after cessation of immunosuppression

Total measurable costs

Treatment	157.000
Investigation of outbreak	40.000
Contact tracing	362.000
Vaccination	<u>113.000</u>
	~ 672.000

= vaccine cost for some 1.200 infants with monovalent HBV vaccine !

Approximate price-tags: I Treatment

	price/unit	#1	#2	#3	#4	#5	sum
Hospitalization one day	4500	7	1	-	-	2	45.000
Out-patient clinic, doctor	1500	-	11	1	2	3	25.500
" nurse	500	-	6	-	0	1	3.500
Antivirals (lamivudin)	20 /d	15 mo					9.000
(adefovir)	200 /d	9 mo					55.000
One secondary clinical case*	19.000	-	1	-	-		19.000
							~ 157.000 KrSEK

[* Scand J Infect Dis 1993;25:693-697]

Price-tag II: Laboratory investigations of outbreak

	price/unit	#1	#2	#3	#4	#5	sum
• HBV serology	160	80					12.800
• HBV-DNA PCR	700	11					7.700
• HBV sequencing	~2.000	3	2	3	1	1	<u>20.000</u>
							~ 40.000

Price-tag III: Contact tracing

	price/unit	#1	#2	#3	#4	#5	sum
Identification of source/s							
• Sexual partners*	1.500		1	-	-	1	3.000
• Each tested blood-donor*	1.500	9	35	111	0	54	313.000
• HBV-DNA PCR blood donors	700		1	1			1.400
• HBV surveillanc 72 dialysispat x4 (ALT surv. every 2 w not incl)	160						45.000
							~ 362.000

* Including time waste [Scand J Infect Dis 1993;25:693-697]

Price-tag IV: Prevention

	price/person	sum
Vaccination of a cohort of 72 dialysis patients, 4x 40 µg, serology afterwards	1400 80	102.000 5.600
Vaccination of 10 staff members Serology afterwards	500 80	5.000 <u>800</u>
		~ 113.000

... to be honest...

...dialyspatients were only tested twice...

...dialysis patients were not vaccinated...

...only 132/209 blood donors have been tested...

...50 % of staff reporting needle-sticks and sharps
are still unvaccinated against HBV...

...lots of opportunities for improvement...

Contributors

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