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HEALTH & CARE 33 YEARS FOR ALL

Effective control of a hospital outbreak by an efficient laboratory set up and infection control system in neonatal intensive care unit

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8th Edition
CAHOCON 2024
6TH & 7TH APRIL 2024

Background

- Health care-associated infections (HAI) are a growing concern leading to increase in the mortality and morbidity among patients

- Isolation of an unusual microbe or a microbe with a certain resistance pattern could signify an outbreak.

- Rise in antibiotic-resistant pathogens and emerging infectious diseases - environmental sources.

Background (contd..)

- Environmental surveillance - proactive tool in identifying the source

- Linking clinical data with environmental findings helps to implement evidence-based strategies to mitigate risks.

Aim

To describe our experience on investigation and the management of an outbreak due to contaminated ultrasound gel and lignocaine gel in the hospital setting.

A cluster of neonates with blood cultures growing *Acinetobacter spp.,* and one child with *Burkholderia cepacia* was notified by primary consultant team to hospital infection control committee (HICC) over a three-week period in end of Jan and Feb 2023.

Outbreak investigation

Outbreak Confirmation with primary team and laboratory team

↓

Infection Control Team Briefing

↓

Case Definition

↓

Line Listing of Cases

↓

Screen for Similarity among cases

- Environmental Surveillance
  - ↓ Identify the Source
  - ↓ Eliminate the Source
- Review of Literature for similar outbreaks
- Auditing and Inspection of Infection Control Practices
  - ↓ Identify the gaps
  - ↓ Implement Control measures

Communicate the findings

Case Definition and Line listing

Neonates admitted in the NICU from 15.01.2023 to 15.02.2023 including those in-born or out-born (after 48 hours of admission) with features of sepsis due to *Acinetobacter sp.,* or *Burkholderia sp.,*

Identifier	Date of Birth	Mode and Place of Delivery	Date of admission	Date of culture	Organism
NICU_001	19.01.2023	Vaginal, in-born	19.01.2023	29.01.2023	*Acinetobacter baumannii* complex
NICU_002	02.02.2023	Emergency LSCS, in-born	02.02.2023	04.02.2023	*Acinetobacter baumannii* complex
NICU_003	04.02.2023	Vaginal, in-born	04.02.2023	08.02.2023	*Acinetobacter baumannii* complex
NICU_004	04.02.2023	Vaginal, in-born	04.02.2023	11.02.2023	*Acinetobacter baumannii* complex
NICU_005	01.02.2023	Emergency LSCS, in-born	01.02.2023	03.02.2023	*Burkholderia cepacia* complex

Infection Control Audits → Hand Hygiene, Bundle care, Care of neonates, Breast milk sterility, Handling of babies by mothers, feeding practices were assessed

Review of Literature for similar outbreaks

CDC Centers for Disease Control and Prevention
CDC 24/7: Saving Lives, Protecting People™

Search

Healthcare-Associated Infections (HAIs)

CDC 〉 Healthcare-associated Infections (HAI) 〉 Outbreak and Patient Notifications

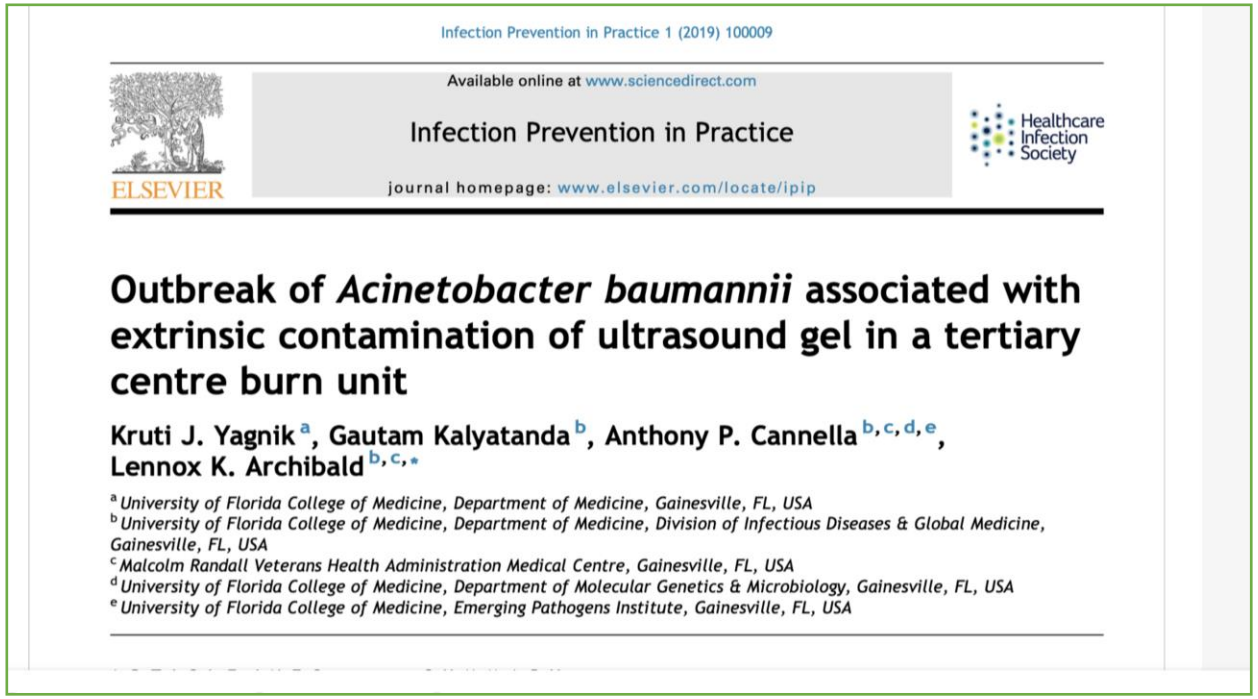
Healthcare-associated Infections (HAI)

HAI Data +

Types of Infections +

Multistate Outbreak of *Burkholderia cepacia* Infections Associated with Contaminated Ultrasound Gel

Print



Infection Prevention in Practice 1 (2019) 100009

Available online at www.sciencedirect.com

Infection Prevention in Practice

journal homepage: www.elsevier.com/locate/ipip

Outbreak of *Acinetobacter baumannii* associated with extrinsic contamination of ultrasound gel in a tertiary centre burn unit

Kruti J. Yagnik [a], Gautam Kalyatanda [b], Anthony P. Cannella [b,c,d,e], Lennox K. Archibald [b,c,*]

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[b] University of Florida College of Medicine, Department of Medicine, Division of Infectious Diseases & Global Medicine, Gainesville, FL, USA
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[e] University of Florida College of Medicine, Emerging Pathogens Institute, Gainesville, FL, USA

Ultrasound gel as a source of hospital outbreaks: Indian experience and literature review

Dhanalakshmi Solaimalai [1], Naveen Kumar Devanga Ragupathi [1], Kala Ranjini [2], Hema Paul [3], Valsan P Verghese [4], Joy Sarojini Michael [5], Balaji Veeraraghavan [1], Ebor Jacob James [2]

Affiliations + expand

PMID: 31745029 DOI: 10.4103/ijmm.IJMM_19_249

Environmental Surveillance

- Surface swabs in incubators, warmers, phototherapy unit, breast milk and feed preparation area in NICU and resuscitation unit in labour room was taken

- Solutions – Common antibiotic vials, Normal saline used for dilution, sterile water used for humidifier in NICU were taken

- Based on the audits and ROL, lignocaine gel in labour room used for PV and USG gel used for NSG, CTG, Central line visualisation was sent for culture

- Breast milk, feed preparation water, RO water

Environmental Surveillance Reports

Microbial surveillance report

PRELIMINARY REPORT - AFTER 24 HOURS ☐ / FINAL REPORT ☑

SNO	SITE	COLONY COUNT	REPORT
	Swabs		
1.	Baby Cot	NIL	No growth in culture
2.	IV Stand	NIL	No growth in culture
3.	Ventilator Monitor	NIL	No growth in culture
4.	PhotoTherapy	NIL	No growth in culture

Interpretation :

Fungal culture will be observed upto 10 days &supplementry report will follow if growth is detected.

If any growth is reported, it is the responsibility of the In-charge to inform the concerned and take corrective action before further usage.

No growth indicates Sterile product /Adequate sterilisation / Disinfection process and Fitness for use.

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Junior Consultant Microbiology

COPY TO: 01 .PNICU 02.FILE

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MEENAKSHI LABS
VEGAMAE VIVEGAM

DEPARTMENT OF MICROBIOLOGY
CONFIDENTIAL REPORT
(For Surveillance purpose only)

Department : Paediatric NICU Received on : 30/01/2023

Mic ID No. 239 Reported on : 01/02/2023

Microbial surveillance report

PRELIMINARY REPORT - AFTER 24 HOURS ☐ / FINAL REPORT ☑

S.No	SITES	COLONY COUNT	REPORT
	Swab		
1	Baby Shifting Trolley-I	NIL	No growth in culture
2	Baby Shifting Trolley-II	NIL	No growth in culture

Interpretation :

If any growth is reported, it is the responsibility of the In-charge to inform the concerned and take corrective action before further usage.
No growth indicates Sterile product /Adequate sterilisation / Disinfection process and Fitness for use.
Fungal culture will be observed up to 10 days &supplementry report will follow if growth is detected.

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MICROBIOLOGY LABORATORY
BACTERIOLOGICAL WATER ANALYSIS

Department: PNICU Received on :23/03/2023

Mic ID No. : 166 Reported on : 25/03//2023

PRELIMINARY REPORT ☐ / FINAL REPORT ☑

S no	SAMPLE	MPN/100ml	REPORT
1.	1ST level Tap water	40	Unacceptable:look for any other structural faults and poor maintenance.Disinfect the equipment and source.
2.	1ST level RO water	0	Excellent
3.	2ND level Tap water	1	Acceptable: but make regular checks
4.	2ND level RO water	1	Acceptable: but make regular checks
5.	3RD level Tap water	0	Excellent
6.	4TH level Tap water	0	Excellent

Interpretation :

Mean count* 44 °C , 100 ml *E.coli* count	Category	comments
0	A	Excellent
1-10	B	Acceptable: but make regular checks
10-50	C	Unacceptable:look for any other structural faults and poor maintenance.Disinfect the equipment and source.
>50	D	Grossly polluted: look for alternative source or carry out necessary repairs and disinfect source .

Reference:
Monica Cheesebrough District Laboratory Practice In Tropical Countries. (2nd Edition)
MackieAndMcCartney Practical Microbiology (14th Edition).

If any unacceptable/grossly polluted report is reported, it is the responsibility of the In-charge to inform the concerned and take corrective action before further usage. Excellent/ Acceptable indicates Sterile product /Adequate sterilisation / Disinfection process and Fitness for use.

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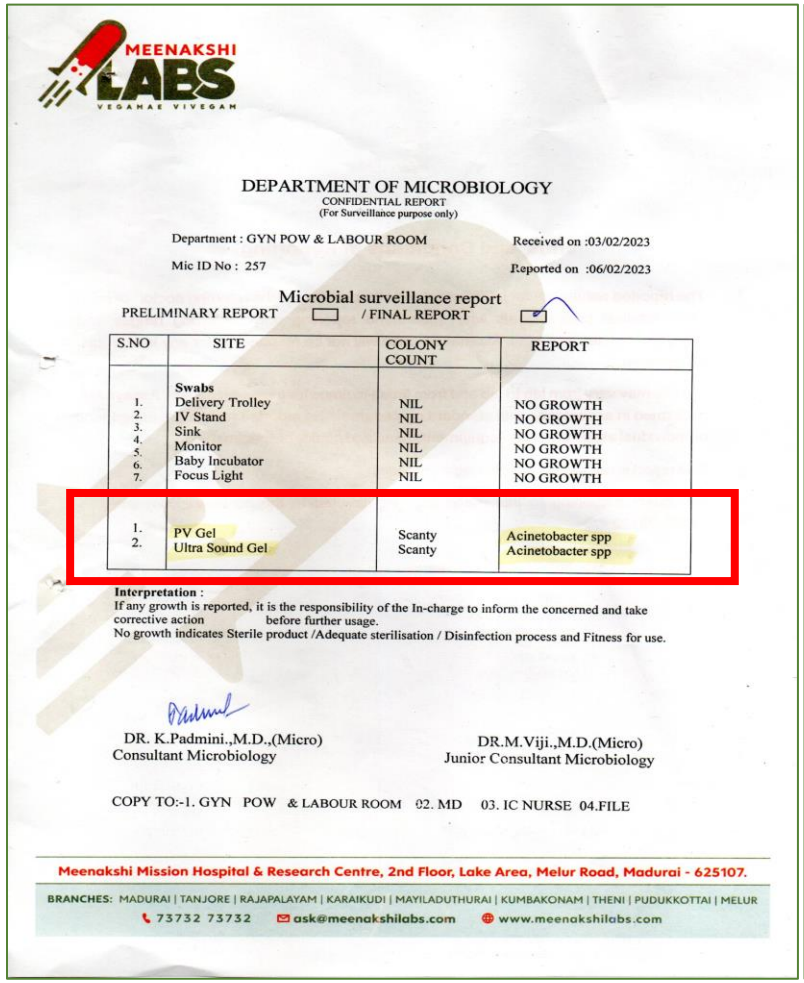
USG gel and Lignocaine gel reports



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DEPARTMENT OF MICROBIOLOGY
CONFIDENTIAL REPORT
(For Surveillance purpose only)

Department : GYN POW & LABOUR ROOM — Received on :03/02/2023
Mic ID No : 257 — Reported on :06/02/2023

Microbial surveillance report
PRELIMINARY REPORT ☐ / FINAL REPORT ☑

S.NO	SITE	COLONY COUNT	REPORT
	Swabs		
1.	Delivery Trolley	NIL	NO GROWTH
2.	IV Stand	NIL	NO GROWTH
3.	Sink	NIL	NO GROWTH
4.	Monitor	NIL	NO GROWTH
5.	Baby Incubator	NIL	NO GROWTH
6.	Focus Light	NIL	NO GROWTH
7.			
1.	PV Gel	Scanty	Acinetobacter spp
2.	Ultra Sound Gel	Scanty	Acinetobacter spp

Interpretation :
If any growth is reported, it is the responsibility of the In-charge to inform the concerned and take corrective action before further usage.
No growth indicates Sterile product /Adequate sterilisation / Disinfection process and Fitness for use.

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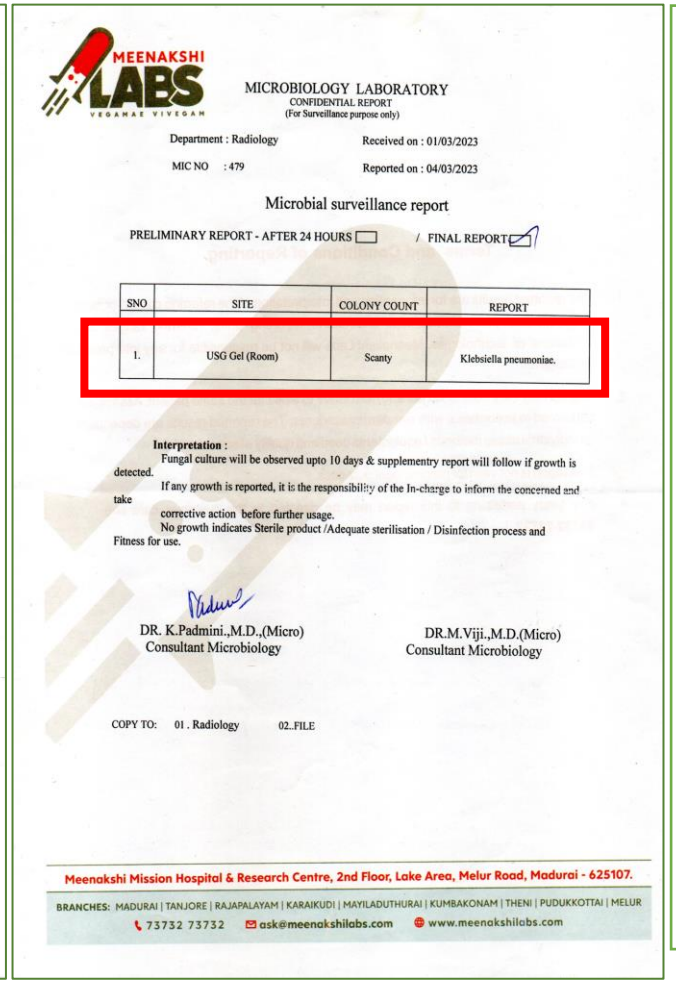

MEENAKSHI LABS
VEGAMAE VIVEGAM

MICROBIOLOGY LABORATORY
CONFIDENTIAL REPORT
(For Surveillance purpose only)

Department : Radiology — Received on : 01/03/2023
MIC NO : 479 — Reported on : 04/03/2023

Microbial surveillance report
PRELIMINARY REPORT - AFTER 24 HOURS ☐ / FINAL REPORT ☑

SNO	SITE	COLONY COUNT	REPORT
1.	USG Gel (Room)	Scanty	Klebsiella pneumoniae.

Interpretation :
Fungal culture will be observed upto 10 days & supplementry report will follow if growth is detected.
If any growth is reported, it is the responsibility of the In-charge to inform the concerned and take corrective action before further usage.
No growth indicates Sterile product /Adequate sterilisation / Disinfection process and Fitness for use.

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Lignocaine Gel in Labour room used for PV (opened): Acinetobacter sp.,

USG gel in Labour room (opened): Acinetobacter sp.,

USG gel in radiology (refilled): Klebsiella sp.,

Lignocaine unopened and USG gel unopened (new, same lot) - No growth

Intervention & Follow up

- Discontinuation of the current practice of dispensing ultrasound gel from a centrally stored container of 5 litres and implementation of single use disposable 250 mL
- Implemented policy of indenting 10g lignocaine LOX gel (from patient side usage) instead of 30g gel (from ward stock)
- Modification of infection control policy to stipulate single-use gel for per vaginal examination and sterile covers for TVS scan probe/transducer
- Educational awareness for infection control champions
- Communication of findings to HIC committee and primary team & administration

5L Gel

30 g lignocaine LOX gel

250 mL
(single use disposable)

10g lignocaine LOX gel

Communication of the findings

Findings of the Audit and Environmental Surveillance was communicated to the HIC committee members and NICU/OG team and

Follow up

After May 2023: No Acinetobacter or Burkholderia infections in Neonates. E.coli, Klebsiella and Enterococci were the predominant organisms till date causing sepsis

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3.	Infection control round in OT	• Dr Malathi presented the IPC rounds reports of MOT, SOT, CTS OT and Ortho OT. • Overall, the compliance to hand hygiene and masking among anaesthesia doctors were not satisfactory. Dr Kannan B suggested to have a meeting with the anaesthesia doctors and have a training session for them.	HICC	1 month
4	Neonatal sepsis	• Dr Malathi presented the increase in the reuse lignocaine gels for urinary catheter insertion and other sterile procedure. Dr Kumar suggested to procure single use small size lignocaine gels for catheter insertion.	HICC	1 month

Prepared by
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Reviewed by
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Medical Director &
Chairperson, HICC

Conclusion

- Contaminated ultrasound and lignocaine gel can be a potential source for healthcare-associated infection, which cannot be overlooked.
- Importance of Clinical Microbiology laboratory for early identification of an outbreak
- Robust environmental surveillance methods to identify the source and eliminate it
- Prompt response of the infection control teams in instituting stringent infection control measures to control the outbreak.

References

- *Outbreak Investigations in Healthcare Settings, Centre for Disease Control and Prevention*
- *Solaimalai D et al., Ultrasound gel as a source of hospital outbreaks: Indian experience and literature review. Indian J Med Microbiol. 2019 Apr-Jun;37(2):263-267. doi: 10.4103/ijmm.IJMM_19_249. PMID: 31745029.*
- *Yagnik KJ et al., Outbreak of Acinetobacter baumannii associated with extrinsic contamination of ultrasound gel in a tertiary centre burn unit. Infect Prev Pract. 2019 Jun 27;1(2):100009. doi: 10.1016/j.infpip.2019.100009. PMID: 34368675; PMCID: PMC8336045.*