AMR and combined FBC/CRP solutions

Tools to fight a critical health issue: Antimicrobial resistance

25th January 2017
POCT / Near patient Solution to ATB Resistance

2010 Antibiotics Prescription

2010 Antibiotics Resistance

Source: Surveillance of antimicrobial consumption in Europe, 2010 Surveillance reports - 04 Mar 2013
HORIBA Near patient Solutions: Microsemi CRP & Pentra MS CRP

Leader in CRP Solutions
Unique HORIBA Medical + CBC solutions

**Pentra MS CRP**

- EDTA Capillary whole blood 18μL
- 3diff
- 3 to 4 mins

**Microsemi CRP**

- EDTA Capillary whole blood 35μL
- 5diff

26 hematology parameters
CRP measurement
WBC differential count
CRP measurement
**Unique HORIBA Medical**  
**CRP**  
**+ CBC solutions**

### WBC 5Diff

- **Absorbance**
- **Cell size**

### CRP

**STEP 1:** Hemolytic reaction

- Anti-CRP antibodies sensitized latex
- CRP antigen

**STEP 2:** Antigen-antibody complex reaction

- Anti-CRP Anti-body
- Sensitized latex

### Notes:

- **WBC** - Impedance method
- **CRP** - Latex Immunoturbidimetry: with hematocrit correction
- **C Differential** - Combination of impedance method, staining technology, light transmission
CRP + FBC Indication for Use

Infection Screening

- Rapid Kinetics
- High Amplitude Variation
- 6 hours post–infection Synthesis
- 18 hours Short half-life
- Rapid decrease if efficient ATB

Infection

Concentration

Time (hours)

Av CEC H0 H4 H24 H48 H72 H96

WBC ($10^3/\mu L$) CRP (mg/L)
CRP at the POCT - FDA approval

FDA-cleared *In Vitro* Diagnostic Devices

**CRP Indication For Use:**

- CRP Test is an *in vitro* diagnostic device for the quantification of C-reactive protein (CRP) in human serum, plasma, and whole blood by a solid phase, sandwich-format, immunometric assay. The measurement of CRP aids in evaluation of the acute inflammatory process induced by infectious microbial agents or by noninfectious inflammatory stimuli.

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**NICE guidelines [CG191] Pneumonia:** Diagnosis and Management of Community- and Hospital-acquired Pneumonia in Adults (2014)

**1.1 Presentation with lower respiratory tract infection**

1.1.1 For people presenting with symptoms of lower respiratory tract infection in primary care, consider a point of care C-reactive protein test if after clinical assessment a diagnosis of pneumonia has not been made and it is not clear whether antibiotics should be prescribed. Use the results of the C-reactive protein test to guide antibiotic prescribing in people without a clinical diagnosis of pneumonia as follows:

- Do not routinely offer antibiotic therapy if the C-reactive protein concentration is less than 20 mg/litre
- Consider a delayed antibiotic prescription (a prescription for use at a later date if symptoms worsen) if the C-reactive protein concentration is between 20 mg/litre and 100 mg/litre
- Offer antibiotic therapy if the C-reactive protein concentration is greater than 100 mg/litre
Infection Type Screening

Treatment decision depends on clinical picture, WBC count, & risk factors.


Source: Holland National College of General Practitioners Guidelines
Primary Care Screening
Immediate decision with a single tube, no centrifugation
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Immediate decision with a single tube, no centrifugation
Study 1 – Paediatric ED

The study was conducted over 24 weeks in the PED, collecting data from 133 children in three groups:
1. Limping children with suspected underlying infective or inflammatory mechanism (24 children)
2. Children with abdominal pain and suspected appendicitis (56 children)
3. Children (over 3 months of age) with pyrexia of unclear origin. (53 children)

**Conclusion**
Appropriate use of point of care testing can improve the quality and effectiveness of patient management. The use of FBC and CRP point of care testing in the PED can be demonstrated to speed up and improve the patient pathway. Indeed it optimized discharge time, prevented unnecessary admission and helped control antibiotics administration to where it was really necessary.
Study 2 – Paediatric ED

• Multi-site Study – Oxford AHSN
  • John Radcliffe
  • Wexham Park
  • Stoke Mandeville

• Part 1 – Instrument evaluation
  • Comparative data with laboratory instruments
    • FBC
    • CRP

• Part 2 – Operational evaluation
  • ED placement/training
  • Feedback
  • Health economics
Thank you

감사합니다

Cảm ơn

ありがとうございます

Dziękuję

धन्यवाद

Grazie

Merci

謝謝

ขอบคุณครับ

Obrigado

Σας ευχαριστούμε

اتشْكر

Tack ska ni ha

Danke

Большое спасибо