HAS THE LABORATORY-BASED SURVEILLANCE OF COMMUNITY ACQUIRED INVASIVE BACTERIAL INFECTIONS IMPROVED THE DIAGNOSIS OF INVASIVE INFECTIONS?

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Introduction: Owing to foundation of Laboratory-Based Surveillance of Community Acquired Invasive Bacterial Infections (BINet), lead by KOROUN, in 2008, diagnostics of invasive infections in Poland was expanded with molecular techniques towards: *Streptococcus pneumoniae, Neisseria meningitidis, Haemophilus influenzae, Listeria monocytogenes, Streptococcus agalactiae and Escherichia coli*. **Aim:** Assessment of diagnostic benefits of entering of Department of Pediatrics of Bielanski Hospital (DP) into the BINet network. **Material and methods:** In 2008-2011 (4 years), 102 samples from 92 patients (48 boys, 44 girls) aged between 6 days to 16 years (mean age 4 years and 4 months) with a suspected invasive infection, hospitalized in the DP, were submitted to KOROUN within participation in the BINet network. Analysis with use of polymerase chain reaction was performed for 50 (46%) full blood samples collected within up to 72 hours after introduction of an antibiotic, 25 (23%) serum samples, 24 (22%) cerebrospinal fluid samples and 3 (3%) samples of pleura fluid, in order to determine presence of genetic material specific for *Streptococcus pneumoniae, Neisseria meningitidis, Haemophilus influenzae, Listeria monocytogenes, Escherichia coli*. In six cases (6%) bacterial strains were submitted (three *Streptococcus pneumoniae* strains from blood and one from cerebrospinal fluid, one *Streptococcus pyogenes* from each sample of pleura fluid and *Haemophilus influenzae* from cerebrospinal fluid) for confirmation of identification and analysis of bacterial serotype. The study group consisted of 59/92 (64%) children with community-acquired pneumonia (CAP), 3/92 (3%) with CAP with *Streptococcus pneumoniae* bacteremia, 8/92 (9%) with bacterial meningitis, 13/92 (14%) with generaliyed infection of unknown localisation, 9/92 (10%) with heavy infections of different localisations. **Results:** The children with CAP with bacteraemia had the highest body temperature at admission; they were treated for the longest period and the length of hospitalisation was significantly greater than in children with CAP without bacteremia. Number of days with fever before hospitalizations was the greatest in children with CAP (3.7 days). In all children included into the study, mean values of inflammation indicators such as number of white blood cells (WBC), acute-phase protein (CRP), or procalcitonin (PCT) were above the normal range. In 28/92 (30%) children, infection aetiology was determined. In 26/92 (28.2%) cases, the cause was bacterial infection, with 12/92 (13%) cases where the infection was caused by bacteria for which diagnostics of the genetic material is not possible within the BINet network. Positive bacteria cultures were obtained in 12 cases (13%). Blood cultures were performed for all children; however, positive results were obtained only in five of them (5.4%). In three cases, the cause of the infection was *Streptococcus pneumoniae* (CAP with bacteraemia), in one *Escherichia coli* (urosepsis) and also in one Klebsiella oxytoca (sepsis). Only one of eight performed cultures of pleura fluid gave bacterial growth (*Streptococcus pyogenes*). Lumbar puncture was performed in 23 cases and two positive cultures were obtained (non-envelope strain of *Hemophilus influenzae* and *Streptococcus mitis*, which was detected in KOROUN as *Streptococcus pneumoniae* serotype 15B). In four children, the analyses performed within the BINet network allowed to diagnose: CAP with Streptococcus pneumoniae aetiology, meningitis - *Listeria* monocytogenes and *Neisseria* meningitidis B and generalized infection - *Escherichia coli*. In total, owing to diagnostics within the BINet network, aetiological factor was determined in 4 out of 28 cases with a confirmed aetiology (14.3%). **Conclusions:** Expanding the routine microbiological diagnostics in children with molecular examinations provided by KOROUN within the BINet network has increased the diagnostic sensitivity and allowed fast and targeted treatment implementation (in children with meningitis, community-acquired pneumonia with bacteremia, generalized infection).

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