

New Assay Helps Distinguish Viral and Bacterial Infections in Children

IAN LACY

FRONTLINE MEDICAL NEWS

An assay testing the presence of three blood-borne host-proteins shows promise in accurately identifying viral and bacterial infections in febrile children, a validation study found.

The three proteins that the ImmunoXpert assay uses to differentiate between viral and bacterial infections are: viral-induced tumor necrosis factor-related apoptosis-inducing ligand (TRAIL), interferon gamma-induced protein-10 (IP-10), and bacterial-induced C-reactive protein (CRP). While TRAIL and IP-10 are novel identifiers, CRP has been used in traditional bacterial detecting assays, Isaac Srugo, MD, and colleagues reported.

The investigators identified 597 potential stored patient serum samples from patients admitted to multiple pediatric EDs and wards in Israel and

Switzerland, and ultimately, 361 samples were selected for assay testing.¹

Of the 361 patients whose samples were selected for testing, the assay identified 209 patients (58%) with a viral infection, 99 patients (27%) with a bacterial infection, and the remaining 53 patients (15%) with an equivocal outcome, according to Dr Srugo of the Ruth and Bruce Rappaport Faculty of Medicine, Technion-Israel Institute of Technology, Haifa, Israel, and his colleagues. The 307 patients with a bacterial or viral diagnosis had sensitivity of 93.8% (95% confidence interval [CI], 87.8%-99.8%) and specificity of 89.8% (CI, 85.6%-94.0%). There were four false-negative and 21 false-positive findings.

The study found that TRAIL and IP-10 were present in higher levels in children with viral infections com-

Emergency Medicine Associate Editor-in-Chief, Francis L. Counselman, MD, to Receive ACEP Award for Outstanding Contribution in Education

Francis L. Counselman, MD, Associate Editor-in-Chief of *Emergency Medicine* will receive the 2017 American College of Emergency Physicians (ACEP) Award for Outstanding Contribution in Education, at the ACEP Scientific Assembly this month. This award is “presented to an ACEP member who has made a significant contribution to the educational aspects of the specialty,” and is the highest award ACEP gives annually regarding education and teaching.

Dr Counselman is the founding Chairman of the Department of Emergency Medicine at Eastern Virginia Medical School (EVMS) in Norfolk, Virginia. Founded in 1992, he continues to serve as Chairman. He served as Program Director of the Emergency Medicine residency program at EVMS from 1990 to 2010. In 1999,

he was made the EVMS Distinguished Professor of Emergency Medicine. He is the recipient of numerous teaching awards, including the Accreditation Council for Graduate Medical Education (ACGME) Parker Palmer “Courage to Teach” Award; the Emergency Medicine Residents’ Association (EMRA) Residency Director of the Year Award; and the EVMS Award for Outstanding Faculty Achievement. He has served as President of the Association of Academic Chairs of Emergency Medicine (AACEM) and the American Board of Emergency Medicine (ABEM). He is also a frequently invited speaker at state and national meetings. Dr

Counselman has served on the Editorial Board of *Emergency Medicine* since 1999; and has been the Associate Editor-in-Chief since 2006.



pared to children with bacterial infections. The opposite was true of CRP results, with significantly lower levels of CRP in children with viral infections compared to those in children with bacterial infections.

“Notably, among the indeterminate diagnosis patients without a reference standard, the assay gave a bacterial or viral outcome for 69% of the cases (the rest were equivocal), with half of these yielding a score associated with a particularly high degree of assay diagnostic confidence,” investigators said. “This finding suggests that the assay may be applicable to ‘harder-to-diagnose’ cases in real-life clinical settings.”

Also, the assay “exhibits consistent performance across a wide range of ages [3 months to 18 years], time from symptom onset, and clinical syndromes,” Dr Srugo and his associates said.

1. Srugo I, Klein A, Stein M, et al. Validation of a novel assay to distinguish bacterial and viral infections. *Pediatrics*. 2017 Sep 13. doi:10.1542/peds.2016-3453 [Epub ahead of print]

Soccer-Playing Girls Five Times More Likely to Return to Same-Day Play After Concussion

KARI OAKES

FRONTLINE MEDICAL NEWS

Soccer-playing girls were five times more likely to return to play on the day of a concussion as were their male peers, according to a study presented at the annual meeting of the American Academy of Pediatrics.

Records from 87 soccer players aged 7 to 18 years (median age, 14 years) were examined in a retrospective review of patients seen over a 2-year period by a single physician at a pediatric sports medicine center. Of these, two thirds ($n = 58$) were girls.

Thirty of the 58 girls (51.7%) reported that they returned to play on the day of their concussion, compared to five of 29 boys (17.2%; $P = .002$). This difference in reporting yielded an odds ratio of 5.14 (95% CI, 1.72-15.3) for girls returning to same-day play, compared with boys who sustained a concussion.

The soccer players included children participating in recreational, club, and school-sponsored soccer, said senior author Shane M. Miller, MD, in an interview. All patients were assessed according to a standardized concussion protocol that involved a neurological examination and validated concussion evaluation tests, including the Immediate Post-Concussion Assessment and Cognitive Test and the Sports Concussion Assessment Tool.

© Laszlob6/Shutterstock



As soccer has grown in popularity as a youth sport, so has the number of reported concussions. “The incidence of reported concussions has increased 1,600% from 1990 to 2014,” wrote Dr Miller and his coauthors in the abstract accompanying the presentation. Dr Miller said that girls are 1.5 times more likely than boys to sustain a concussion while playing soccer.

While seeing the patients who were the subject of the study, Dr Miller realized that most of the soccer players had not come out of play for evaluation after the head impact. Rather, they had continued to play, only later reporting concussion symptoms to coaches, trainers, or parents.

“The athletes may have chosen not to say anything because they didn’t want to come out of the game,” said Dr Miller, a sports medicine physician at Texas Scottish Rite Hospital for Children, Dallas.

“I was surprised by the significant degree of difference” between male and female soccer players, said Dr Miller. The study was not designed to get at the reason for the discrepancy, so Dr Miller could not say with certainty whether awareness of concussion symptoms is significantly lower for female athletes, or whether the athletic culture more strongly encourages minimization of symptoms for girls than boys. In any case, he said, there is room for education of players, coaches, and families to raise awareness of the importance of recognizing and reporting concussion, and then removing the affected athlete from play.

Dr Miller said that future research directions include collaboration with other facilities to conduct prospective research using a concussion registry. This will allow more robust statistical analysis and help ascertain the degree of regional variation in pediatric sports concussion management.

“Current education efforts may not be enough to help athletes, parents, and coaches identify concussion symptoms, know the guidelines for immediate removal from play, and understand the risks of returning to play after an injury. More research is needed on how to better spread this message intended to protect the health of young athletes....” Aaron Zynda, the study’s first author and clinical research coordinator at Texas Scottish Rite, said in a press release accompanying the abstract. “Concussion recognition and identification is a team effort,” he said.

Opioid Management Protocol Reduced Trauma Patient Pain Medication Use

ELI ZIMMERMAN

FRONTLINE MEDICAL NEWS

A pain management protocol implemented in a trauma service reduced opioid intake in trauma patients while improving patient satisfaction, according to a retrospective study.

The opioid epidemic continues to grow every day, partly as a result of irresponsible overprescribing of opioid medication, according to Jessica Gross, MB BAO BCh, a trauma surgeon from Wake Forest Baptist Health, North Carolina, at the American Association for the Surgery of Trauma annual meeting. Dr Gross and her colleagues developed a pain management protocol (PMP) to provide adequate pain control while using fewer opioids in the postdischarge setting. They tested their PMP through a retrospective chart review of 498 patients admitted to the trauma service between January 2015 and December 2016, half of whom were admitted before the PMP was initiated and half of whom were admitted afterward.

The PMP involved a stepped approach to treating pain, with acetaminophen or ibuprofen as needed for mild pain, one 5-mg tablet of oxycodone/acetaminophen every 6 hours for moderate pain, two tablets for severe pain, and 50 to 100 mg of tramadol every 6 hours for breakthrough pain.

Counseling services for patients who were found to be in danger of substance abuse were provided in the hospital, and at discharge, patients received a weaning

plan for their medication, according to Dr Gross.

If the short-acting medications were found to be inadequate to control pain, patients were given slow-release pain medication as needed.

The average total medication, which included medication given at discharge and for refills, prescribed after PMP initiation was 1,242 morphine milligram equivalents (MME), compared with 2,421 MME prior to implementation of the protocol ($P < .0001$).

After the protocol was implemented, Dr Gross and her colleagues found the number of patients for whom a refill was prescribed dropped from 39.7% to 28.1%, and the size of those refills dropped from 1,032 MME to 213 MME on average.

“By having a comprehensive pain management protocol, we can reduce the amount of pain medications we prescribe for outpatient use, after discharge from the trauma service,” said Dr Gross, “...not only by decreasing the number of refills we were providing, but also the amount of pain medications that was prescribed within these refills.”

A Press Ganey survey analysis of patients during the month before and the month after the PMP implementation, found a significant increase in overall patient satisfaction and satisfaction with pain management, according to Dr Gross,

Certain limitations include not being able to confirm whether patients received prescription medication elsewhere, nor any concrete data on patient satisfaction after discharge other than an inference based on fewer refills and lower refill MME.