A RAPIDLY MEASURABLE HOST ASSAY COMPRISING TRAIL, IP-10 AND CRP HAS POTENTIAL TO REDUCE ANTIBIOTIC OVERUSE WITHOUT INCREASING UNDERUSE IN ADULTS WITH SUSPECTED LOWER RESPIRATORY TRACT INFECTION

S. Halabi[1], S. Shiber[2], M. Paz[4], T. M. Gottlieb[3], E. Barash[3], R. Navon[3], E. Moscoviz[3], T. Ilan-Ber[3], L. Shani[3], N. Petersiel[4], O. Boico[3], M. Grupper[4], E. Simon[3], D. Kirshner[4], N. Avni[3], D. Haber[1], M. Stein[3], Y. Maor[5,6], C. Guetta[2], M. Benari[1], Y. Lishtzinsky, [2] M. J. Drescher[2], K. Oved[3], E. Eden[3], A. Neuberger[4]

[1]Carmel Medical Center, Haifa, Israel; [2]Rabin Medical Center, Petah Tikvah, Israel; [3]MeMed, Tirat Carmel, Israel; [4]Rambam Health Care Campus, Haifa, Israel; [5]Wolfson Medical Center, Holon, Israel; [6] Israel Faculty of Medicine, Tel Aviv University, Tel Aviv, Israel

Funding declaration: The Observer study was supported by the European Commission under H2020-SMEINST-2-2015 [grant number 684589]

Background:

Identifying infectious disease etiology is oftentimes challenging, yet essential for appropriate patient management, including antibiotic use. Studies have shown that a host assay comprising TNF-related apoptosis induced ligand (TRAIL), interferon gamma induced protein-10 (IP-10) and C-reactive protein (CRP) accurately differentiates bacterial from viral infections with negative predictive value >98%. Here we estimate the potential impact of the host assay to complement current practice for adults with suspected lower respiratory tract infection.

Results:

Out of 583 adults recruited, 422 met infectious inclusion criteria; of these, 314 were assigned etiological labels, 210 viral and 104 bacterial infections. Patients with bacterial infections were older (mean 61 years (SD 21) vs. 51 (SD 20); p<0.001), had higher fever (mean 39.0°C (SD 0.7) vs. 38.6 (SD 0.6); p<0.001), and were more likely to be admitted (77.0% vs. 31.0%; p<0.001). Based on discrepancy between physician's prescription and assay results, the host assay has potential to reduce antibiotic prescription to virally infected patients by 3.0-fold (p< 0.001), from 55.7% (95% confidence interval, CI 49.0-62.3) to 18.6% (95%CI: 13.9-24.4), without impacting antibiotic underuse.

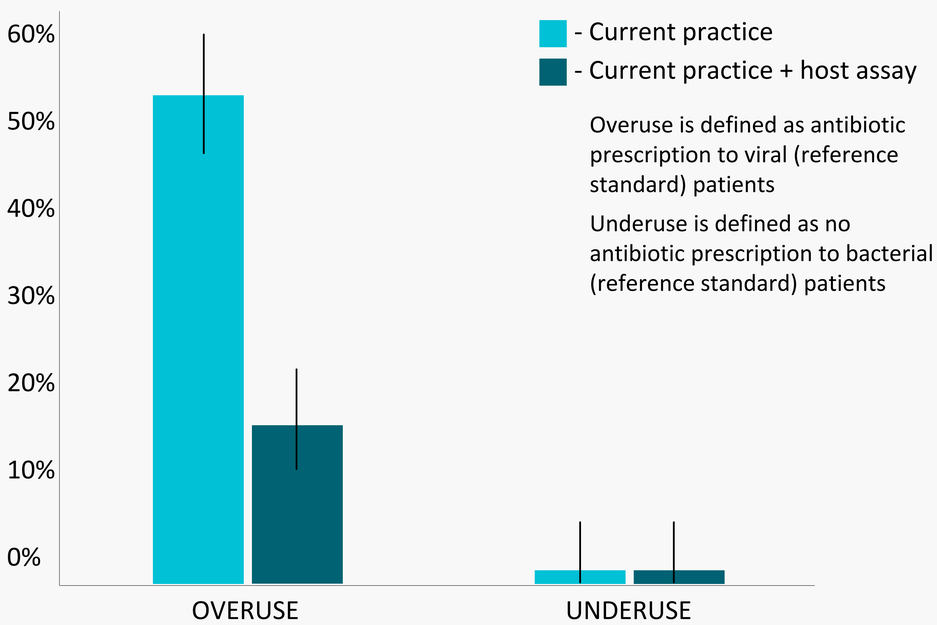
Methods:

Adults aged >18 years with suspected lower respiratory tract infection were prospectively recruited at three medical sites (OBSERVER; grant #684589; NCT003011515). Infection etiology was adjudicated by three independent experts based on clinical, laboratory, microbiological, radiological and follow-up data. The host assay was performed retrospectively, giving three possible outcomes, viral, bacterial or equivocal. Assay performance and expert adjudication were blinded to one another. To estimate the assay's possible impact on antibiotic misuse, the treatment documented in the medical record was considered the 'current practice', and it was assumed that a timely contraindicative assay result would have triggered a change in practice ('current practice + host assay'), with current practice occurring in cases of equivocal results.

Conclusions:

Timely provision of TRAIL/IP-10/CRP assay results has the potential to complement current practice and contribute to improved antibiotic stewardship practices.

Estimated impact on antibiotic use



Patient enrollment flow