MeMed BV Testing Supports Safe Antimicrobial Stewardship in an Urgent Care Network: Case Control Study Using Real-World Data

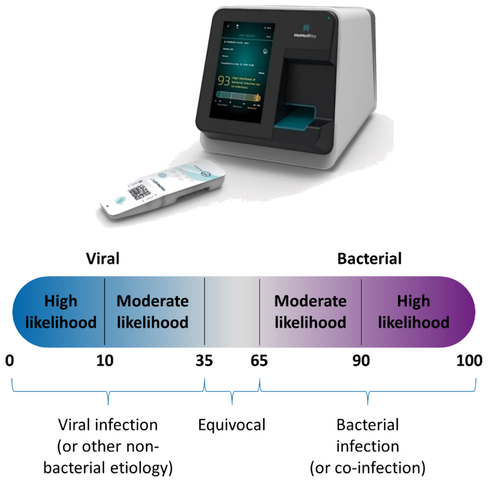
B. Kalmowich[1], N. Orvieto[1], D. Rahamim-Cohen[1], S. Shapiro Ben David[1]
[1]Maccabi Healthcare Services - Tel Aviv (Israel)

Background and objective

In Urgent Care Centres (UCCs), prescribing appropriate antibiotics is challenging due to limited diagnostic tools and the need for rapid evaluation. MeMed BV® (MMBV) is an adjunctive, rapid host-protein test that differentiates bacterial from viral infections by integrating levels of three immune proteins into a bacterial likelihood score. Maccabi Healthcare Services (MHS) has >2.7 million members and an integrated network of 10 UCCs. In 2022, MHS implemented MMBV in its UCC network. This study aimed to evaluate the clinical utility of MeMed BV by comparing outcomes in pediatric patients for whom the test was ordered with those of propensity-score (PS) matched control patients.

Methods

This was a case-control study using real-world MHS data. Cases were children aged 3 months to 18 years who underwent MMBV testing as part of routine care during UCC visits (2022-2023). PS-matched controls (1:1) were drawn from a cohort of 38,820 children with febrile illness presenting to the UCC in 2022 who were not tested with MMBV. The PS encompassed 28 parameters that likely influence the likelihood of ordering MMBV (Figure 1). The primary analysis compared patient outcomes among matched cases and controls. The secondary analysis focused on cases with MMBV results <35 (indicating viral infection) and their matched controls.



Results

Table 1. Patient characteristics

Characteristic	Unmatched cohort N = 38,820	Matched cohort N = 2,016	MMBV cohort N = 2,016
Demographics			
Female	19,409 (50%)	1,059 (53%)	1,037 (51%)
Age (years)	4.0 (1.0, 8.0)	3.0 (2.0, 7.0)	3.0 (2.0, 6.0)
SES decile	7.00 (6.00, 9.00)	7.00 (6.00, 8.00)	7.00 (6.00, 9.00)
History (Past 7 days)			
Antibiotics prescribed	1,779 (4.6%)	202 (10%)	218 (11%)
ED visit	2,406 (6.2%)	171 (8.5%)	203 (10%)
Testing at UCC			
Culture ordered	9,824 (25%)	1,076 (53%)	1,147 (57%)
WBC ordered	8,082 (21%)	1,968 (98%)	1,961 (97%)
Chest X-ray ordered	5,034 (13%)	815 (40%)	934 (46%)
Discharge Diagnosis			
Fever	9,751 (25%)	1,157 (57%)	1,322 (66%)
URTI	15,573 (40%)	412 (20%)	258 (13%)
LRTI	3,023 (7.8%)	292 (14%)	252 (13%)
Gastroenteritis	6,651 (17%)	491 (24%)	189 (9.4%)
Cough	2,824 (7.3%)	180 (8.9%)	135 (6.7%)
Viral infection	2,908 (7.5%)	130 (6.4%)	388 (19%)
Other diagnosis	2,313 (6.0%)	237 (12%)	55 (2.7%)
UTI	903 (2.3%)	79 (3.9%)	54 (2.7%)
Pain	1,593 (4.1%)	99 (4.9%)	66 (3.3%)
UCC Visit Outcomes			
Antibiotics prescribed	12,823 (33%)	738 (37%)	652 (32%)
ED referral	3,513 (9.0%)	288 (14%)	303 (15%)
Follow Up (7 days after UCC visit)			
Primary care visits	17,565 (45%)	1,151 (57%)	1,222 (61%)
Antibiotics prescription	4,206 (11%)	323 (16%)	210 (10%)
Unplanned hospitalization	391 (1.0%)	42 (2.1%)	53 (2.6%)

MMBV testing significantly reduced antibiotic prescribing (14% relative reduction; p<0.0001). Most patients received viral scores (n=1387, 68.8%), among whom reductions were greater (36%→20%; 45% relative reduction), without increases in unplanned hospitalizations or 7-day antibiotic use.

Figure 1. Propensity score matching covariate balance before/after matching

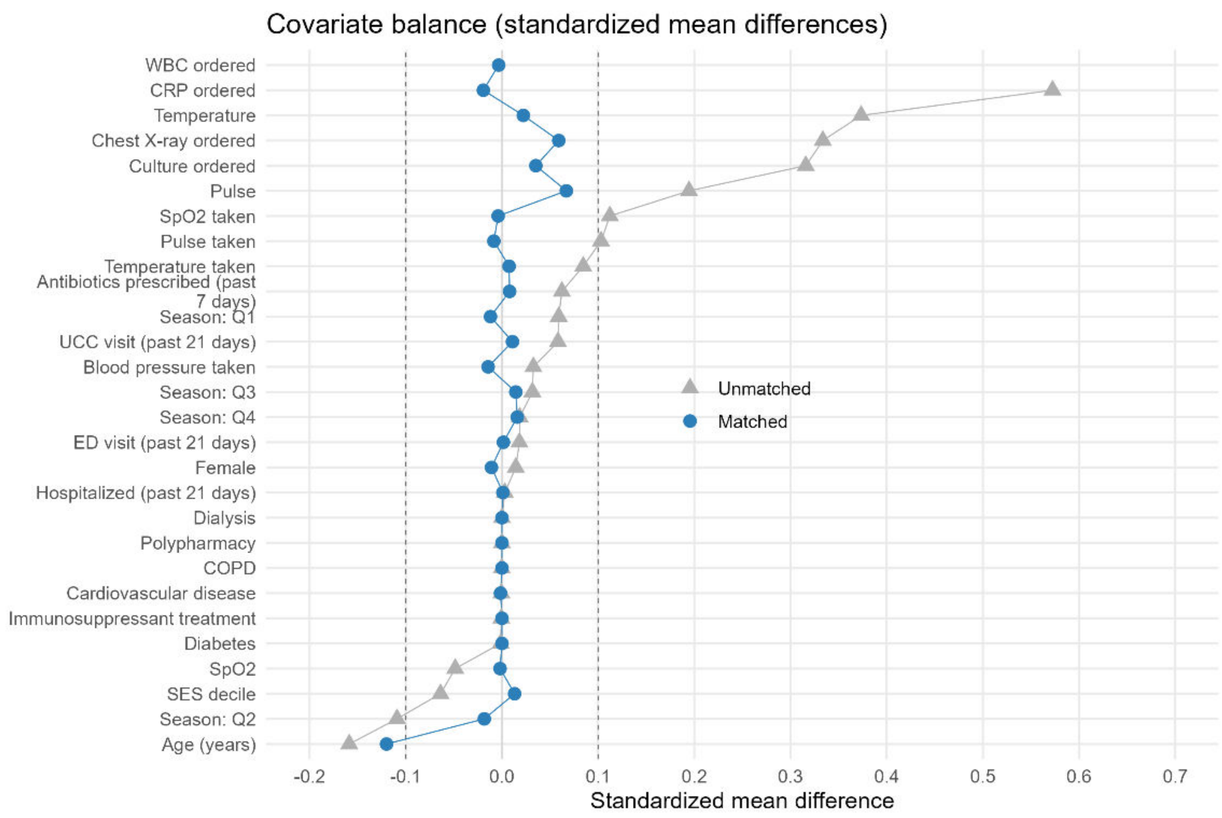
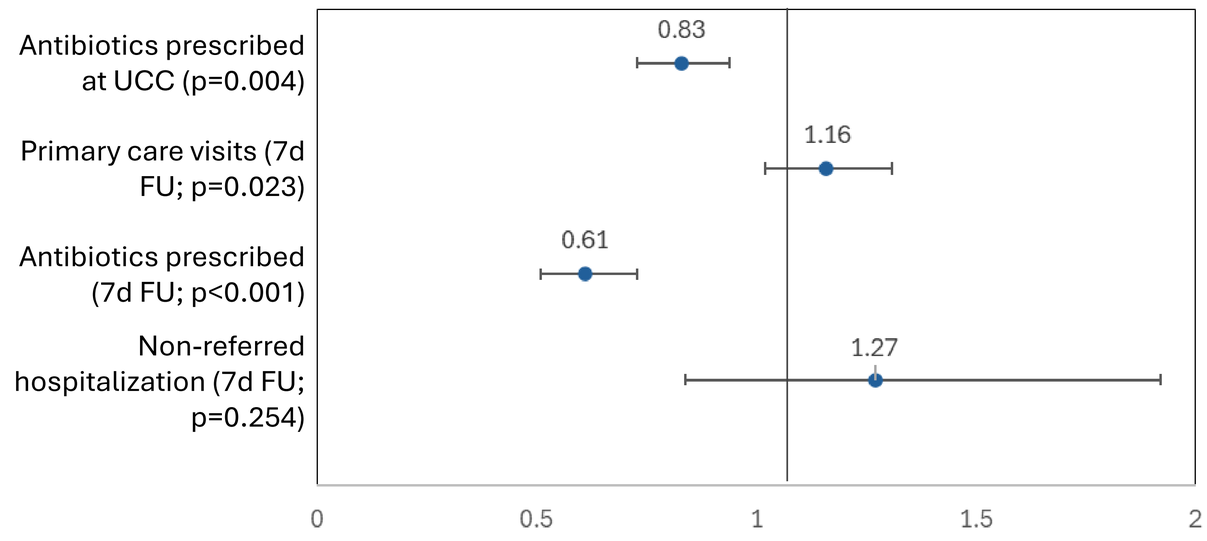


Figure 2. Impact of MMBV on patient outcomes

Forest plot of odds ratios (OR) with 95% confidence intervals (CI), representing the average treatment effect on the treated (ATT).



There was no increase in hospitalizations or antibiotic prescriptions outside the UCC within 7 days of the UCC visit

Conclusions

MMBV implementation led to a reduction in antibiotic prescribing during the UCC encounter without increasing antibiotic prescribing or hospitalization in the 7 days post-visit. The implementation supported safe antibiotic stewardship.

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