

# THE CHOICE OF MUELLER-HINTON AGAR SIGNIFICANTLY AFFECTS THE PENICILLIN MIC OF PNEUMOCOCCI



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## INTRODUCTION

Susceptibility to penicillin is determined by measuring the MIC, often by using the E-test on Mueller-Hinton (MH) agar with horse blood.

Using this method and MH agar from Oxoid, we noticed that strains falling into the intermediately resistant category could have lower penicillin MIC than expected, despite following the recommendations from the manufacturer.

The aim of the study was to find the reason for this discrepancy.

## MATERIAL AND METHODS

Eleven penicillin non-susceptible clinical isolates and a pneumococcal reference strains ATCC-49619 (penicillin MIC 0.25-1 mg/L) were tested for penicillin MIC using the E-test.

Mueller-Hinton agar from two manufacturers was used, Becton Dickinson (BBL Mueller-Hinton II Agar) and Oxoid (Mueller-Hinton Agar). Both agars were supplemented with horse blood.



## RESULTS

Strain no.	BBL-MH	SIR	Oxoid-MH	SIR
IS 1	1.5	R	0.75	I
IS 2	1.5	R	0.75	I
IS 3	1.5	R	0.5	I
IS 4	3	R	1	I
IS 5	1.5	R	0.5	I
IS 6	1.5	R	0.75	I
IS 7	3	R	0.75	I
IS 8	2	R	0.75	I
IS 9	2	R	0.5	I
IS 10	2	R	0.5	I
ATCC 49619	0.5	I	0.25	I

The quality control strain (ATCC-49619) was classified as intermediate both on Mueller-Hinton agar from Becton Dickinson and Oxoid. The QC results fulfilled the quality control criteria for the strain, but in most instances at its lowest limit when the MH agar from Oxoid was used.

The penicillin MIC was consistently higher with the MH agar from Becton Dickinson, especially for strains with penicillin MIC between 0.5-1.0 mg/l on MH agar from Oxoid. The penicillin MIC for these strains was often 2-4x higher when tested on MH agar from Becton Dickinson than from Oxoid.

Strains with penicillin MIC of 0.5-1.0 mg/l on the MH agar from Oxoid, meet the CLSI criteria for intermediate and are therefore considered amenable to oral treatment. These strains often had MIC of 1.5-3 mg/l on the Becton Dickinson agar, and should therefore be classified as resistant and not amenable to oral treatment.

The results using the MH agar from Becton Dickinson were more in agreement with the results from other reference laboratories (International Circumpolar Surveillance, Interlaboratory Streptococcus pneumoniae Serotyping and Antibiotic Susceptibility Testing Quality Control Program).

## CONCLUSIONS

The choice of MH agar significantly influenced the penicillin MIC and may therefore be clinically important and affect the prevalence rates of penicillin resistance in surveillance studies.