

RESEARCH ARTICLE

Gamma gap thresholds and HIV, hepatitis C, and monoclonal gammopathy

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Table 2. Diagnostic performance of gamma gap for HIV using different gamma gap thresholds, N = 25,680.

Gamma gap (g/dL)	Sn, %	Sp, %	LR +	LR -	Overall AUC (95% CI)
≥ 2.5	94.8	10.5	1.1	0.5	0.80 (95% CI: 0.75, 0.85)
≥ 3.0	84.4	51.9	1.8	0.3	
≥ 3.5	59.3	88.1	5.0	0.5	
≥ 4.0	39.3	98.4	24.2	0.6	
≥ 4.5	19.3	99.6	54.1	0.8	
≥ 5.0	10.4	99.9	139.4	0.9	
≥ 5.5	4.4	100.0	283.9	1.0	

Table 3. Diagnostic performance of gamma gap for HCV using different gamma gap threshold, N = 45,134.

Gamma gap (g/dL)	Sn, %	Sp, %	LR +	LR -	Overall AUC (95% CI)
≥ 2.5	97.8	9.9	1.1	0.2	0.74 (95% CI: 0.72, 0.76)
≥ 3.0	80.8	50.2	1.6	0.4	
≥ 3.5	44.5	86.9	3.4	0.6	
≥ 4.0	19.0	97.8	8.5	0.8	
≥ 4.5	7.0	99.5	13.7	0.9	
≥ 5.0	2.6	99.8	16.3	1.0	
≥ 5.5	1.1	99.9	13.9	1.0	

Table 4. Diagnostic performance of gamma gap for MGUS using different gamma gap thresholds, N = 6,118.

Gamma gap (g/dL)	Sn, %	Sp, %	LR +	LR -	Overall AUC (95% CI)
≥ 2.5	97.6	6.4	1.0	0.4	0.64 (95% CI: 0.60, 0.69)
≥ 3.0	75.7	39.9	1.3	0.6	
≥ 3.5	39.1	80.1	2.0	0.8	
≥ 4.0	15.4	95.4	3.4	0.9	
≥ 4.5	7.7	98.9	6.9	0.9	
≥ 5.0	5.3	99.7	16.7	0.9	
≥ 5.5	3.0	99.8	17.6	1.0	

Conclusions:

- Gamma gap is not a sufficient screening tool (you'd want high sensitivity for a screen)
- An elevated gamma gap warrants further testing for HCV and HIV but not MGUS
- Many patients with HIV and HCV did not have an elevated gamma gap
- HIV and HCV stage of treatment influence the gamma gap

Limitations:

- This study was performed in defined patient populations, so patients with comorbid conditions were not assessed and there was no assessment of a mixed population (HIV, HCV, and MGUS)
- These were outpatients and none had autoimmune conditions, chronic inflammatory conditions, or chronic infections
- When the gamma gap was test further in this study
 - HIV: age > 18
 - HCV: age > 6
 - MGUS: age > 50

A Clinical Decision Rule to Aid Ordering of Serum and Urine Protein Electrophoresis for Case-Finding of Paraproteins in Hospitalized Inpatients

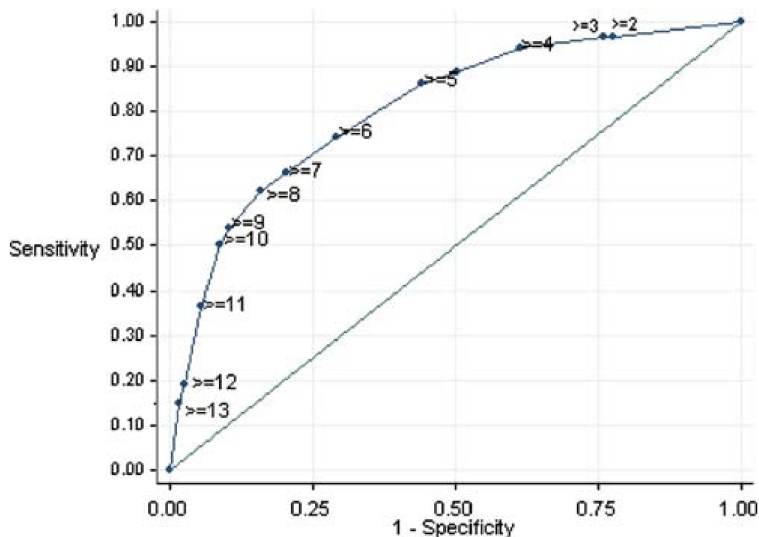
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For MGUS use the following equation:

$$\text{Logit} \left[\frac{\text{SPE}/\text{UPE}^+}{\text{SPE}/\text{UPE}^-} \right] = -4.4 + 1.5x\text{globulin} + 1.1x\text{age} + 0.6x\text{hgb} + 0.4x\text{sex} + .2x\text{gfr}$$

Variables	OR (95% CI)	Scores
Globulin, g/l		
>41	4.5 (3.8, 5.4)	5
≤41		0
Age, years		
≥60	2.9 (2.4, 3.7)	3
<60		0
Hemoglobin, g/l		
<121	1.9 (1.5, 2.3)	2
≥121		0
Sex		
Male	1.6 (1.4, 1.9)	2
Female		0
eGFR, ml/min/1.73 m ²		
<60	1.3 (1.1, 1.5)	1
≥60		0
Total scores		0–13



Score (prob. of para-protein)	Derivation set				Validation set			
	SPE/UPE		LR ⁺ (95% CI)	PPV (%)	SPE/UPE		LR ⁺ (95% CI)	PPV(%)
	Positive	Negative			Positive	Negative		
0–5(Low)	207	6,537	1.0	3.1	91	2,797	1.0	3.1
6–10(Med)	303	2,205	2.5(2.4–2.7)	12.1	129	941	2.5(2.3–2.7)	12.1
≥11(High)	294	506	6.7(5.9–7.6)	36.8	127	221	6.6(5.4–7.9)	36.5