

Diagnostic efficacy of 24-2C SITA Standard global summary indices



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PURPOSE

- 24-2C SITA Standard is a prototype visual field (VF) test using the 24-2C test pattern, which added 10 new test locations to the 24-2.
- In this clinical study, we explored the diagnostic efficacy of global summary indices derived from 24-2C SITA Standard in a preliminary cohort of normal and glaucomatous eyes.

METHODS

- 24-2C SITA Standard (SS-C) and 24-2C SITA Faster (SFR-C) VFs were acquired on an HFA3 perimeter (ZEISS, Dublin, CA) at each of two visits on one eye of a group of 30 normal and 34 glaucomatous subjects.
 - 24-2 SITA Standard (SS) and 24-2 SITA Faster (SFR) VFs were extracted from 24-2C VFs.
 - The last qualified test for each VF was used for data analyses.
 - 10-2 SITA VFs were acquired, but not used in these analyses.
- The diagnostic performance for the VF global indices of Mean Deviation (MD), Visual Field Index (VFI) and Pattern Standard Deviation (PSD) was assessed using the area under the receiver operator characteristic curve (AROC) and sensitivity at 95% specificity.
- AROCs for global indices were compared to those of SS and SS-C.

CONCLUSIONS

- Despite a limited study cohort size, findings in this preliminary cohort suggest that the new 24-2C SITA Standard global summary indices have similar (non-inferior) diagnostic performance to those of the existing 24-2 and 24-2C SITA strategies.
- In terms of global summary indices, 24-2C SITA Standard may provide a reasonable clinical alternative to current clinical threshold strategies for the diagnosis of glaucoma and potentially staging disease severity.
- Future work may include larger, confirmatory studies in order to improve the estimates of diagnostic efficacy.

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RESULTS

- Mean age was 58.4 (standard deviation, SD: 7.8; range: 44 to 75) years for 30 normal subjects and 71.6 (SD: 9.2; range 53 to 98) years for 34 glaucoma subjects.
- Mean MD_{SS-C} was 0.23 (SD: 0.94; range: -1.63 to 2.45) dB and -8.57 (SD: 8.15; range: -25.29 to 1.39) dB in normal and glaucomatous eyes (P<0.001), respectively (see Table 1).
- The AROC of MD_{SS-C} was 0.94. Compared to MD_{SS-C}, the AROC for MD_{SS}, MD_{SFR}, and MD_{SFR-C} were 0.93 (P=0.120), 0.94 (P=0.602), and 0.94 (P=0.944), as shown in Table 2. The sensitivities at 95% specificity were 82.0% (MD_{SS}), 71.0% (MD_{SFR}), 85.0% (MD_{SS-C}), and 76.0% (MD_{SFR-C}), respectively.
- The AROC of VFI_{SS-C} was 0.97. Compared to VFI_{SS-C}, the AROC for VFI_{SS}, VFI_{SFR}, and VFI_{SFR-C} were 0.96 (P=0.799), 0.96 (P=0.818), and 0.96 (P=0.807), as shown in Table 2. The sensitivities at 95% specificity were 88.0% (VFI_{SS}), 88.0% (VFI_{SFR}), 88.0% (VFI_{SS-C}), and 85.0% (VFI_{SFR-C}), respectively. Similar results were observed for PSD.

Index	Test	Normal	Glaucoma	P
MD [dB]	SS	0.29 ± 1.04	-8.15 ± 7.81	<0.001
	SFR	0.25 ± 1.17	-7.85 ± 7.22	<0.001
	SS-C	0.23 ± 0.94	-8.57 ± 8.15	<0.001
	SFR-C	0.30 ± 1.09	-8.16 ± 7.65	<0.001
VFI [%]	SS	99.3 ± 0.8	75.0 ± 24.5	<0.001
	SFR	99.3 ± 0.9	77.4 ± 22.0	<0.001
	SS-C	99.4 ± 0.6	73.6 ± 26.1	<0.001
	SFR-C	99.4 ± 0.7	76.0 ± 24.4	<0.001
PSD [dB]	SS	1.65 ± 0.45	7.37 ± 4.28	<0.001
	SFR	1.51 ± 0.53	7.04 ± 4.33	<0.001
	SS-C	1.68 ± 0.68	7.53 ± 4.34	<0.001
	SFR-C	1.44 ± 0.48	7.14 ± 4.44	<0.001

Table 1. Summary Indices (Mean ± SD)

Index	Test	AROC	P vs SS	P vs SS-C	Sens @ Spec95
MD [dB]	SS	0.93 [0.87, 1.00]	--	0.120	82.0%
	SFR	0.94 [0.87, 1.00]	0.915	0.602	71.0%
	SS-C	0.94 [0.88, 1.00]	0.120	--	85.0%
	SFR-C	0.94 [0.88, 1.00]	0.560	0.944	76.0%
VFI [%]	SS	0.96 [0.91, 1.00]	--	0.799	88.0%
	SFR	0.96 [0.91, 1.00]	0.937	0.818	88.0%
	SS-C	0.97 [0.92, 1.00]	0.799	--	88.0%
	SFR-C	0.96 [0.91, 1.00]	0.933	0.807	85.0%
PSD [dB]	SS	0.96 [0.91, 1.00]	--	0.841	85.0%
	SFR	0.96 [0.90, 1.00]	0.813	0.930	74.0%
	SS-C	0.96 [0.91, 1.00]	0.841	--	82.0%
	SFR-C	0.96 [0.91, 1.00]	1.000	0.882	79.0%

Table 2. AROC with 95% Confidence Interval and Sensitivity at 95% Specificity

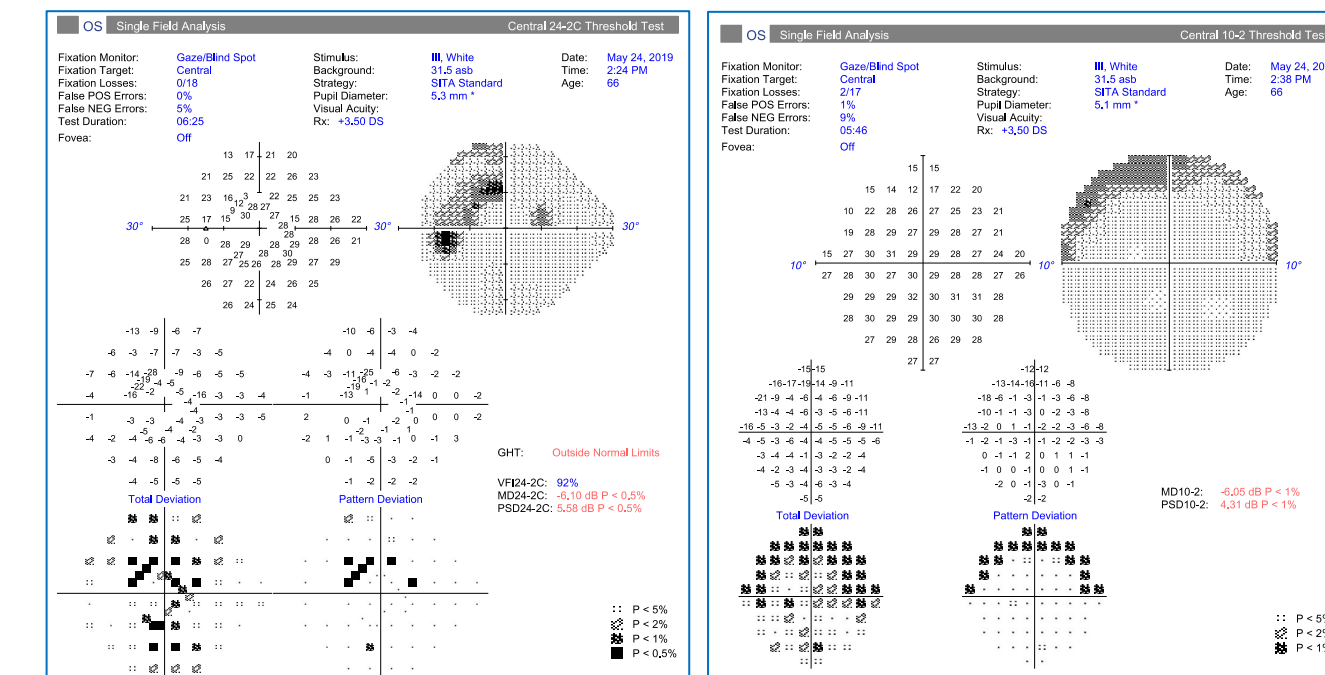


Figure 1. Example of a SITA Standard 24-2C test (left) and SITA Standard 10-2 test (right) on the same eye. The 24-2C test pattern shows a similar sensitivity to detect visual field loss as the 10-2 test in the common central 10-degree test locations.

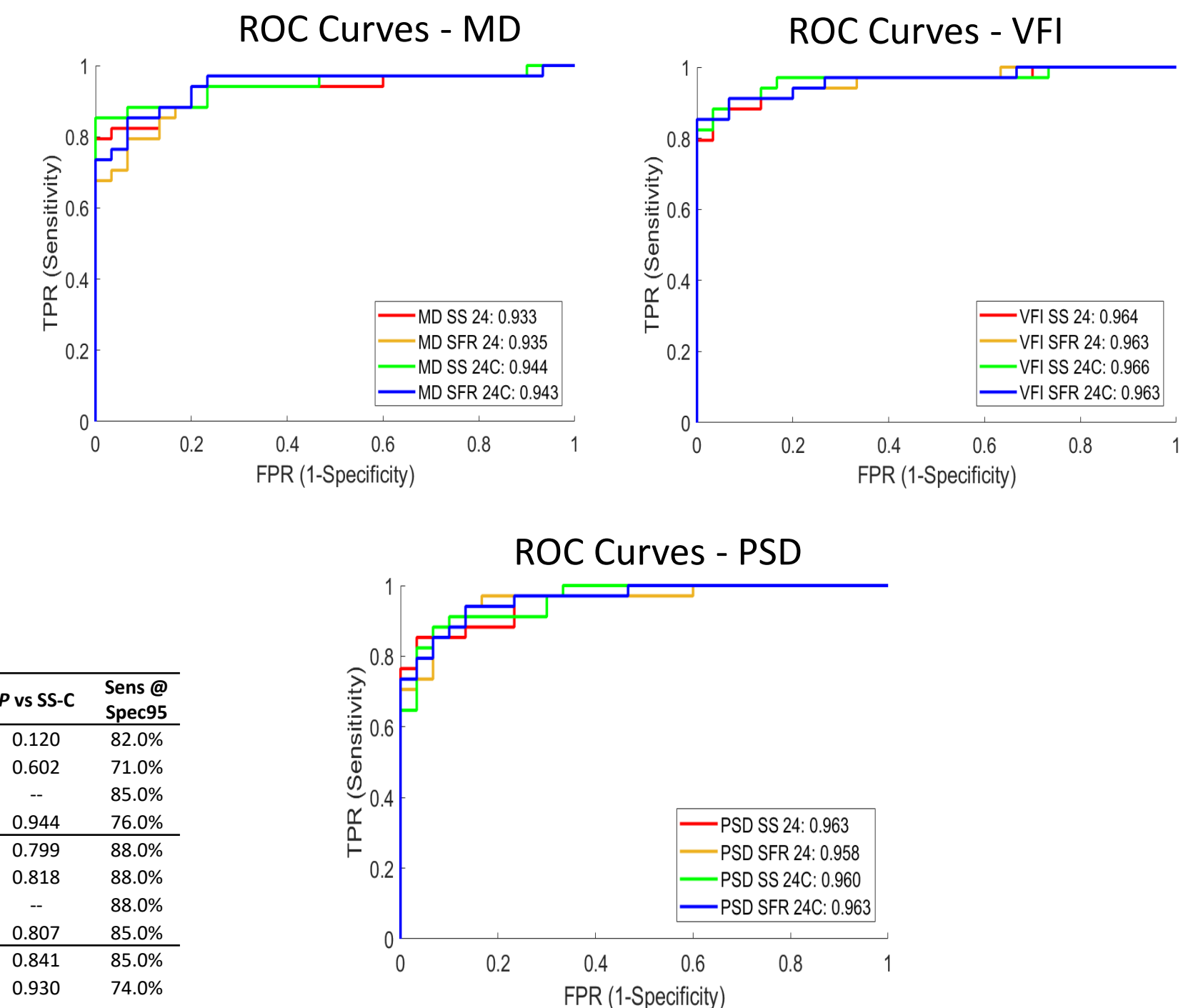


Figure 2. ROC curves for MD, VFI, and PSD

