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Evaluation of the Application of HIV-1 Genotypic Drug Resistance in Treatment Naïve Patients in Taiwan Where Single Tablet Regimens Are Used as the First-Line Regimen

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BACKGROUND: According to the national HIV treatment guidelines, four single tablet regimens (STR), TDF/FTC/EFV, TDF/FTC/RPV, ABC/3TC/GTD, and TAF/FTC/Cobi/EVG, are recommended as the first-line regimens in the antiretroviral-naïve HIV-1-infected patients in Taiwan since September 2016. A multicenter surveillance study of genotypic resistance of HIV-1 among antiretroviral-naïve patients in Taiwan was conducted to determine the prevalence of transmitted drug resistance (TDR) to evaluate whether the pretreatment drug resistance test is required in treatment-naïve patients who will receive STR as the first-line regimen.

Table 1. The list of STRs recommended as the first-line regimens in the antiretroviral-naïve, HIV-1-infected patients in Taiwan

STR regimen	nNRTI-based		INSTI-based	
Components	TDF/FTC/	TDF/FTC/	ABC/3TC/	TAF/FTC/Cobi/
	FFV	RPV	DTG	EVG

METHODS: Genotypic resistance assays were performed in the HIV strains from antiretroviral-naïve patients receiving HIV care in the designated hospitals around Taiwan from June 2012 to September 2018. Resistance mutations were identified using the HIVdb program of the Stanford University HIV Drug Resistance Database.

Table 2. Baseline characteristics of the study subjects

		Period 1 (2012/6~2015)	Period 2 (2016-2018/9)
Case numbers		2691	1394
Male gender, % (n)		96.8(2605)	96.3(1342)
Age at diagnosis, mean (SD), years		32.3(9.0)	32.3(9.4)
HIV transmission route, % (n)	Homosexuals/bisexuals	69.3(1866)	86.2(1202)
	Heterosexuals	4.6(124)	5.3(74)
	Injecting drug users	8.9(239)	7.2(101)
	Unknown	17.2(462)	1.2(17)
HIV subtype, % (n/N)	B, % (n/N)	82.9(2230)	83.1(1158)
	CRF01_AE, % (n/N)	5.5(148)	5.6(78)
	CRF07_BC, % (n/N)	11.1(299)	9.9(138)
	Others, % (n/N)	0.5(14)	1.4(20)
HIV RNA load at diagnosis, mean (SD), log ₁₀ copies/mL		4.83(0.72)	4.88(0.73)
CD4 counts, mean (SD), counts/mL		308(199)	326(286)

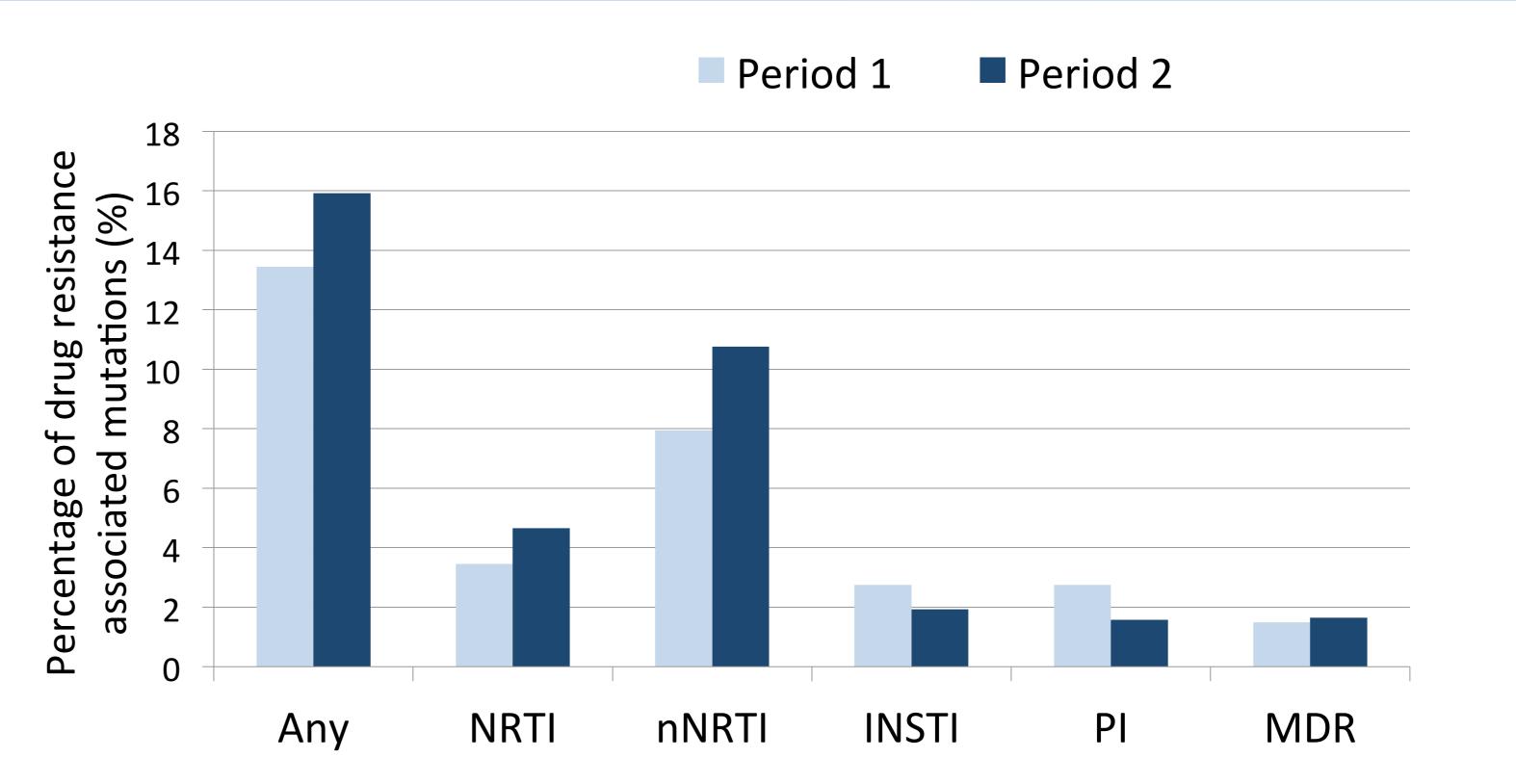


Fig 1. Prevalence of Drug Resistance Associated Mutations. INSTI: integrase strand transfer inhibitor; MDR: multi-drug resistance. (Period 1: 2012/6-2016; Period 2: 2016-2018/9)

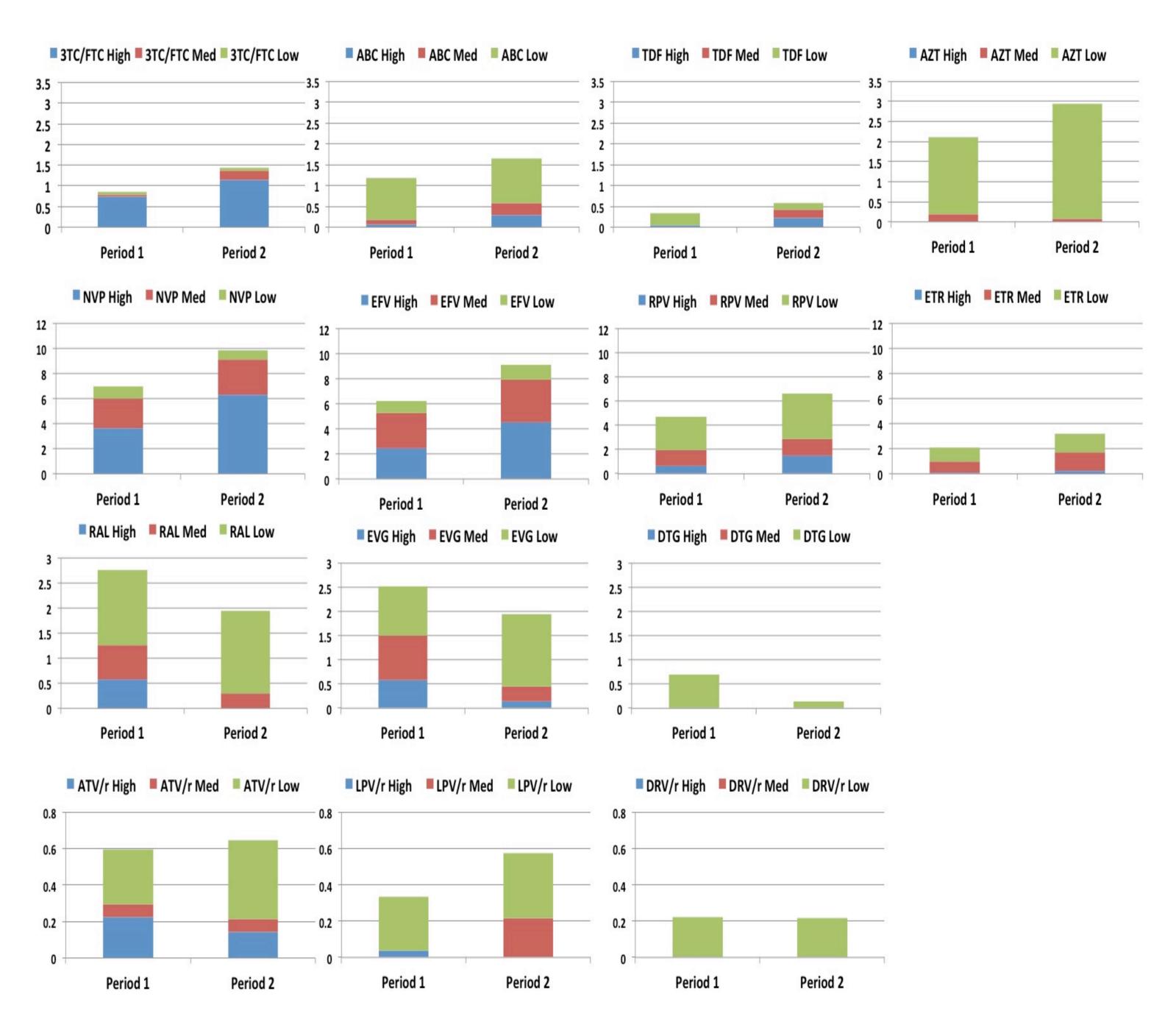


Fig 2. Prevalence of Genotypic Drug Resistance to Various Antiretroviral Drugs.

CONCLUSIONS: In Taiwan, the prevalence of TDR to nNRTIs increases significantly to 10.76% recently, which is above the threshold of the TDR prevalence recommended for pretreatment drug resistance test, yet the prevalence to INSTIs remains low (1.93%). It is recommended that for those treatment-naïve patients who choose nNRTI-based STR as the first-line regimen, a drug resistance test should be performed, while drug resistance test is not required for those who choose INSTI-based STR as the first-line regimen.