VORICONAZOLE TROUGH CONCENTRATION MONITORING AND DOSE OPTIMIZATION AT A CANCER HOSPITAL PAKISTAN

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OBJECTIVE

Voriconazole trough concentration monitoring is crucial for optimizing dosing, minimizing the risk of adverse effects at suboptimal levels, and improving treatment outcomes in patients with invasive fungal infections.

We aimed to evaluate serum trough concentrations obtained after the initial recommended dose and assess factors associated with achieving optimized serum levels.

METHODS

A retrospective cross sectional study was conducted in which data related to voriconazole prescribing between January 2019 and December 2020 for both adults and pediatric patients was collected.

Voriconazole serum levels obtained after initiating the recommended dose, were recorded.

Data related to renal and hepatic functions was collected before and after each dose level of voriconazole.

Descriptive statistics were used to summarized the data, while binary logistic regression identified factors linked to non-optimal voriconazole concentrations.

TABLE 1. INDICATIONS FOR VORICONAZOLE

Category	*n*	*%*
Prophylactic	42	29.2
Treatment	102	70.8

TABLE 2. CHARACTERISTICS OF PARTICIPANTS

Category	*Sub-Category*	*n*	*%*
Gender	Male	91	63.2
	Female	53	36.8
Age (years)	Child (0- 17)	74	51.4
	Adult (18-40)	47	32.6
	Older Adult (41-75)	23	16
Diagnosis*	Acute Lymphoblastic Leukemia	62	43.05
	Burkitt's Lymphoma	17	11.81
	Acute Myeloid Leukemia	9	6.25
	Hodgkin's Lymphoma	7	4.86
	Diffuse Large B Cell Lymphoma**	7	4.86
	Non-Hodgkin's Lymphoma	5	3.47
	Chronic Lymphocytic Leukemia	3	2.08
	T-Cell Acute Lymphoblastic Leukemia	3	2.08

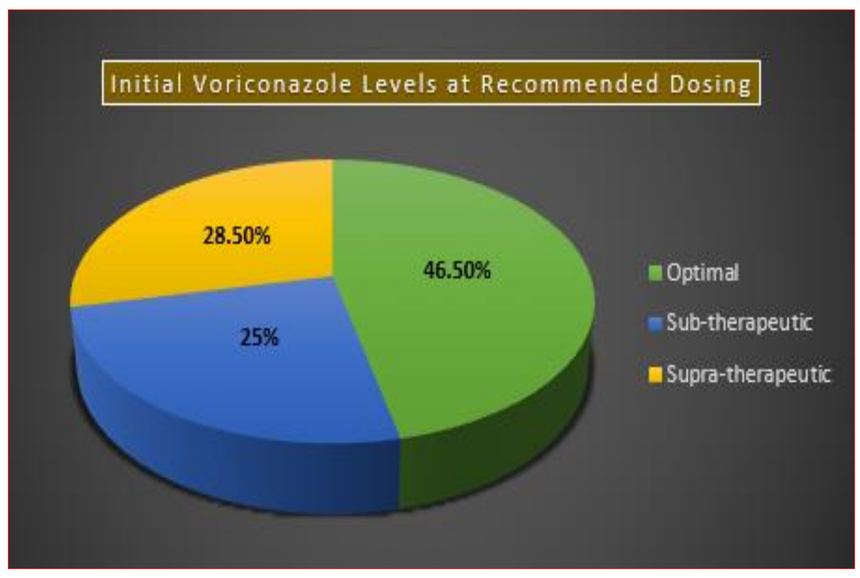
Diagnosis of around 80 % of the participants with blood cancers. Diffuse Large B Cell Lymphoma shown as a separate sub-category apart from NHL.*

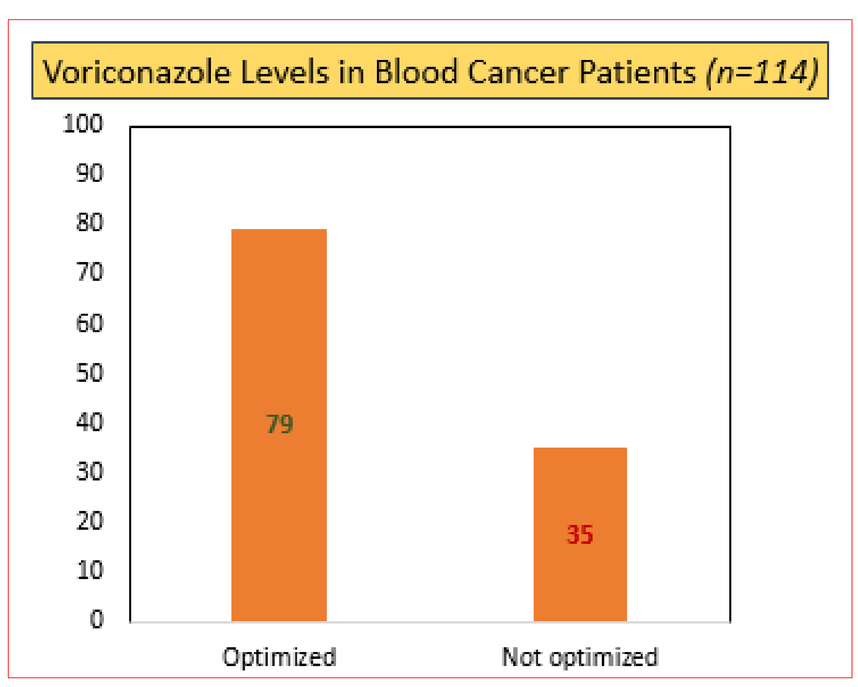
TABLE 2. ROUTE OF ADMINISTRATION FOR VORICONAZOLE

Category	*n*	*%*
Oral	139	96.5
IV	5	3.5

RESULTS

144 patients with 267 trough levels were included. 79.16% (n=114) of patients were of blood cancers and 70.8% (n=102) of prescriptions were for treatment indications. Out of 144, 46.5% (n=67) reached target levels at initial recommended dosing, whereas 25% (n=36) and 28.5% (n=41) were sub- and supra-therapeutic, respectively. 62.3% (n=48) of the patients adjusted the dose according to levels. No toxicity of grade III/IV identified. Review of diagnosis showed that in blood cancer patients, 30.7% (n=35) of patients were with not optimized levels. Lower age (0-17 years) [odds ratio (OR)=6.324, 95% confidence interval (CI)=(1.350-29.636), p=0.019] and low weight (OR=0.979, 95% CI=(0.962-0.996), p=0.015)) were identified as potential predictors associated with non-optimal levels of voriconazole.





CONCLUSION

The initial recommended dosing of voriconazole was well tolerated; however, it did not lead to optimized therapeutic levels, especially in our pediatric patients with blood cancers. Further randomized trials with a large population focusing individualized dosing are needed to determine the impact of predictors on non-optimized levels.