ABC and VED Analysis in Medical Stores Inventory Control

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Abstract

Background: The basic principle of inventory control is ABC based on cost criteria and VED on criticality.
Methods: Based on ABC-VED matrix, economic analysis of drug expenditure of priced vocabulary of medical stores (PVMS) section 01 for the year 2003 of a 190 bedded service hospital was under taken.
Result: Out of 493 drugs in PVMS section 01, only 325 drugs were being used in the reference hospital. The total cost of drugs used was Rupees 55,23,503. Of these 325 drugs, 47(14.4%) drugs were Category A , consuming 70% of total expenditure, 73 (22.46 %) drugs Category B consuming 20% and rest 205 drugs (63.7%) Category C drugs cost only 10% of expenditure. VED categorization done by consensus opinion of medical officers, found 24 (7.3%) drugs vital, 160 (49.3%) essential and rest 141 (43.3 %) desirable.
Conclusion: On coupling the two techniques ABC-VED matrix was made and drugs were classified in to Category I (AV+BV+CV+AE+AD) comprising 68 drugs, Category II (BE + CE +BD) 159 and Category III (CD) 98 drugs. The management of Category I drugs was monitored by top management resulting in better control on the annual expenses and at the same time making available the vital Category II by middle and Category III at lower mangerial level.

Introduction

With the advent of advanced medical technology and drugs, the expenditure on health care delivery is increasing disproportionately as compared to the resources available. Armed Forces Medical Services (AFMS) provides state of the art medical care through a network of over 100 hospitals varying from peripheral to tertiary care hospitals with a central procurement system.

The drugs consume approximately 60 % of total consumable budget [1,2]. In a study from a large state funded hospital, control measures for expensive drugs have resulted in 20 % savings [3]. Of all the inventory control systems ABC and VED matrix is most suitable for medical stores. Hence the coupling of ABC and VED matrix for drug inventory in a hospital.

ABC analysis popularly known as "Always Better Control" is a very useful approach to material management based on Pareto's principle of "Vital few and trivial many" based on the capital investment of the item. According to Pareto's theory 10% items consume about 70 % of budget (Group A). The next 20% consume 20 % of financial resources (Group B) and remaining 70 % items account for just 10% of budget (Group C)

[4,5] (Table 1). VED analysis is based on the criticality of an item. "V" is for vital items without which a hospital cannot function, "E" for essential items without which an institution can function but may affect the quality of the services and "D" stands for desirable items, unavailability of which will not interfere with functioning.

Material and Methods

The study was conducted at a 190 bedded service hospital. All the drugs expended under section one of the priced vocabulary of medical stores (P V M S) during January to December 2003 were included in the study.

(a) For ABC analysis, the annual consumption of all the drugs was calculated after multiplying unit cost by annual consumption and resulting figures were arranged in descending order of rupee value. The drugs then classified in to A B C categories according to total cost consumed 70 %, 20 %, and 10 %.

Table 1
Showing ABC analysis

Item	Items (%)	Money value (%)
A	10	70
B	20	20
C	70	10

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Table 2

ABC analysis of drugs (PVMS section 01)

Drug analysis	Category			Total
	A	B	C	
Total annual consumption (%)	70	20	10	100
Value of annual consumption (Rupees)	38,66,452.00	11,04,701.00	5,52,350.00	55,23,503.00
Number of items	47	73	205	325
Number as percentage	14.0	22.46	63.70	100

(b) For VED analysis, all the drugs under section one of PVMS were distributed to a panel of ten medical personnel comprising physician, surgeon, gynaecologist, anaesthetist, pathologist, paediatrician and four medical officers. They were asked to classify the drugs into vital, essential and desirable. The drugs were categorised if more than 50 % members of panel concurred.

(c) The data was coupled into an ABC and VED matrix resulting in drug categorisation of Category I, II, and III.

Results

Of the total 493 drugs in P V M S (section 01) only 325 drugs were used in the reference hospital with an annual drug expenditure (ADE) of Rs 55,23,503.40. Of these drugs,

Table 3

Percentage of drugs in specific range against ADE

Percentage of drugs	Number	ADE (Rupees)	ADE (%)
10	33	34,35,098.30	62.19
20	65	8,30,655.00	15.04
30	98	4,78,146.30	8.60
40	130	3,11,369.80	5.60
50	163	2,01,025.10	3.60
60	195	1,21,049.30	2.19
70	228	76,565.80	1.38
80	260	43,308.30	0.78
90	293	21,659.20	0.39
100	325	4,625.90	0.08

47 (14.4 %) consume 70 % of ADE comprising group A, 73 (22.46 %) consume 20 % of ADE forming group B and the rest 205 (63.7 %) drugs consume merely 10 % of total budget classified in to group C drugs (Table 2).

Table 3 depicts the percentage of drugs in the incremental order against the corresponding consumption value. The ADE for first 10 % of drugs is Rs. 34,35,098.30 (62.19 %) as against only Rs. 4,625.90 (0.08 %) for last 10 % of the drugs. Table 4 shows that the number of vital drugs are 24 (7.3 %), essential 160 (49.3 %) and desirable 141 (43.4%) in the study series.

Table 5 shows that by combining ABC and VED classification, the drugs can be coupled in to following groups:-

Class I AV + BV +CV +AE +AD
3 + 2 + 19 + 34 + 10 = 68
Class II BE + CE + BD
38 + 88 + 33 = 159
Class III CD = 98

The ABC-VED matrix shows that management of class I (68 vital items) by the top management i.e commandant would help in keeping a check on the annual budget and their availability. The middle level management by officer-in-charge medical stores for class II (159 items) and lower level mangement for class III drugs is desirable.

Discussion

The study shows that out of 325 drugs, 47 (14.6%)

Table 4

Distribution of drugs into VED classification

Category of drugs	Number of drugs	% of drugs	Concurrence of medical personnel on drug classification					
			100%	90%	80%	70%	60%	50%
Vital	24	7.3	3	4	3	2	4	8
Essential	160	49.3	10	8	19	27	45	51
Desirable	141	43.4	1	7	38	47	32	16
Total	325	100	14	19	60	76	81	75

Table 5

ABC–VED matrix

	V		E		D		Total number of drugs	Percentage of drug
	Combined category	No. of drugs	Combined category	No. of drugs	Combined category	No. of drugs		
A	AV	3	AE	34	AD	10	47	14.46
B	BV	2	BE	38	BD	33	73	22.46
C	CV	19	CE	88	CD	98	205	63.07
		24		160		141	325	100.0

* No. = number

Table 6

Showing the comparable data on different studies

Consumption value (ADE)	Classical study (%)	Present study (%)	CGHS study [6] (%)	Govt Hosp Nagpur [7] (%)
70 %	10	14.6	17.8	10.7
20 %	20	22.4	22.6	20.6
10 %	70	63	59.6	68.6

drugs consume 70% of ADE (Group A), 73 (22.46 %) consume 19.99 % of ADE (Group B) and the rest 205(63%) drugs consume just 9.99 % of the total budget. Our study is comparable to other studies [6,7], conducted at Central Government Health Services (CGHS) stores and Government Hospital, Nagpur (Table 6).

For drug inventory management, if we consider ABC analysis alone, we effectively control the recommended 47 drugs from Group A, but will be compromising on the availability of drugs of vital nature from B and C categories (2 +19).

The ABC-VED matrix shows that category I comprises (AV, AE, AD, BV and CV) 68 drugs, category II (BE, CE , BD) 159 and Category III (CD) 98 drugs. The management of class I vital drugs would help in keeping a check on the annual budget and their availability. An effort could be made to bring down the number of AD items (ten items), which take away a good chunk of the budget and their non-availability is not going to make much difference to the quality of health care services. The management of class II (159 items) could help in providing all the essential drugs. In a comparable study [6], ABC-VED matrix shows that out of 292 items, 63 (21%) items were class I, 164 (56%) class II, and 65 (22%) class III.

With the decentralisation of procurement in AFMS, the cost factor becomes important for optimum utilsation of resources.Most of the drugs used in the hospital have to be either purchased from companies, which have entered into rate contract with the central government for a specified period. Autonomous hospitals have the advantage of being the decision makers in determining the source of supply and therefore exercise price/supply period control.

Conflicts of Interest

None identified

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