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Cost of medical detoxification among drug and alcohol users in a private Texas hospital

Alberto Coustasse

Marshall University, coustassehen@marshall.edu

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COST OF MEDICAL DETOXIFICATION AMONG DRUG AND ALCOHOL USERS IN A PRIVATE TEXAS HOSPITAL

Alberto Coustasse, MD, MBA, DRPH

Health Management and Policy department, School of Public Health

University of North Texas Health Science Center at Fort Worth

ABSTRACT

Purpose: The purpose of this study was to estimate the costs of medical detoxification among patients with alcohol and substance abuse disorders.

Design/methodology/approach: The study data was drawn from a medical detoxification program in a community hospital in Texas. Secondary data analysis of 1337 cases from three years was reviewed. Age, gender, race, alcohol, cocaine, cannabis, amphetamines, sedatives, opioids, financial classification, cost, Length of Stay (LOS) and cost by LOS were analyzed using Kruskal–Wallis test and Mann Whittney U test.

Findings: The sample comprised of 42.8% women and 57.2% males. The mean cost and cost by LOS was highest for cocaine ($2,560.1 & $1,044, $P<.01$), while opioid and cannabis ($815.5, $p<.01$; $823.7, $p<.01$) had significantly higher values than the rest. In each individual drug detoxification class, except for amphetamines, the mean and median LOS has been reported to be less among the uninsured category compared to privately insured subjects. In addition, the cost by LOS was also found to be higher in the uninsured group compared to those with private insurance. Subjects who were uninsured and abused alcohol had higher median costs of detoxification ($P<.01$) by LOS. **Research limitations/ implications:** Further in-depth analysis for confounding and interactions

between variables is warranted. **Originality/value:** This research provides an estimation of LOS of a medical detoxification program by financial class in the US and illustrates that early discharge of uninsured and Medicaid patients can be attributable to aggressive case management practices, interrupting the normal course of care.

INTRODUCTION

According to Healthy People 2010, health disparities are defined as differences in morbidity and mortality that occur by gender, race or ethnicity, income or education level, disability, geographic location or sexual orientation (U.S. Department of Health and Human Services, 2000). The existence of racial and ethnic disparities in health care represents the failure of the healthcare system to provide equal, high quality health care to all individuals, regardless of ethnicity, race and other factors. The publication of Healthy People 2010 advanced a goal for the elimination of all health disparities in the United States, and acknowledged that a comprehensive strategy incorporating research, education, policy changes, and community partnerships is fundamental to accomplishing this goal (U.S. Department of Health and Human Services, 2000). Lack of health insurance coverage represents a major barrier to health care utilization and is associated with having poorer physical and mental health (Wu, Kouzis, and Schlenger, 2003). According to 2006 U.S Census Bureau, there were 47 million uninsured people or 16% of the population, in the year 2005 (DeNavas-Walt, Proctor, and Smith, 2007). Hispanics

were least likely to have health insurance (32.7%), followed by Non-Hispanic Blacks (NHB) (19.6%) and Non-Hispanic Whites (NHW) (11.1%). Racial and ethnic differences persist in access to managed care (Hargraves, Cunningham, & Hughes, 2001). For all ethnic/racial groups, financial barriers, including being uninsured, underinsured and publicly insured, hinder timely access to the healthcare system (Weinick, Zuvekas, & Cohen, 2000; Aday, 2001; Langwell & Moser 2002), and parity for health and mental health care insurance has been opposed by employers and insurance companies as too costly.

Race and ethnicity are predisposing factors that can also affect access to mental health services or substance abuse treatment (Snowden, 2001; Wang, Demler, Kessler, 2002). According to the substance abuse and mental health administration (SAMHSA), access to substance abuse treatment can be affected by race/ethnicity factors and urbanization of residence among others (SAMHSA, 1998). As a result, non-Hispanic Blacks and Hispanics are likely to receive fewer mental health services or less substance abuse treatment than needed (Wells, Klap, Koike, & Sherbourne, 2001). In addition, several studies have shown that for patients with substance use disorders entering treatment, there has been a substantial post treatment decline in the utilization and costs of hospital and emergency room services (Stein, O'Sullivan, Ellis, Perrin, & Wartenberg, 1993; Parthasarathy, Weisner, Hu, & Moore, 2001).

Substance use disorders, currently, are among the most costly medical and public health problems in the United States (Califano, 1998; McLellan, Lewis, O'Brien, & Kleber, 2000). In 2004, an estimated 22.5 million Americans, or 9.4% of total population, were classified with substance dependence or abuse (National Survey on

Drug Use and Health [NSDUH], 2004). Drug abuse and addiction have a significant impact on individual lives, families, and communities, which is devastating. Illicit drugs enter Texas from Mexico through cities such as El Paso, Laredo, McAllen, and Brownsville, as well as through smaller towns along the border (Maxwell, 2006). Texas has lost about 13,518 lives in 2000, due to alcohol- and drug-related causes, which comprised nine percent of total deaths of the state. In terms of age distribution, substance related deaths accounted for more than one-third (38%) of all deaths among 15- to 24-year-olds (Liu, 2000). The 2002-2003 NSDUH, ranked Texas as one of the ten states with lowest substance abuse and dependence facilities, with only 7.15% of its population and 556 reported treatment facilities (SAMHSA, 2005). In 2005, among the total admissions to the Texas Department of Health and Human Services funded treatment programs, heroin and other opiates together accounted for 13.6% of the admissions while alcohol accounted for 23.9% and crack cocaine 17.4 % (Maxwell, 2006). The average age at which admissions occurred was 35.6 years for heroin, 34.5 years for other opiates, and 37.1 years for alcohol and 25.5 years for crack cocaine. Percentage of emergency room visits were 31.3%, 53.3%, 35.9% and 39.1% for heroin, other opiates, alcohol and crack cocaine, respectively. Heroin was responsible for 54.5% of employment problems while alcohol and crack cocaine were attributable to 55.8% and 62% of same problem respectively (Maxwell, 2006).

Medical detoxification is the process where by individuals are systematically withdrawn from addictive drugs in an inpatient or outpatient setting, typically under the care of a physician (National Institute on Drug Abuse [NIDA], 2005). Detoxification is sometimes called a distinct treatment modality but is more appropriately considered a

precursor of treatment, because it is designed to treat the acute physiological effects of stopping drug use. Medications are available for detoxification form opiates, cocaine, benzodiazepines, alcohol, barbiturates, and other sedatives. In some cases, detoxification may be a medical necessity, and untreated withdrawal may be medically dangerous or even fatal (NIDA, 2005).

METHODOLOGY

Study population: The study was performed in a 215 bed, non-profit, standalone hospital in Texas, which was the primary hospital for a local medical school. This medical facility contracted services with a national detoxification program that provided inpatient emergency medical detoxification services for adults with alcohol and drug related problems. All individuals, eighteen years or older (n=1,342), receiving medical detoxification services from fiscal year 2001 to fiscal year 2003, were identified using the detoxification program database. Five cases were excluded as their Length of Stay [LOS] was 0 as they were patients discharged Against Medical Advised (AMA).

Study variables:

Variables considered were age, gender, race/ethnicity, and financial class, utilization of alcohol, cocaine, opioid; cost, length of stay and cost by length of stay. Age was categorized into four groups: 18-34, 35-49, 50-64 and 65 and older. Race/ethnicity was self-determined and recorded as NHW, NHB, Hispanic, and Other. Other category included individuals of Asian, Native American, or Unknown ethnicity/race. Subjects were categorized into six different financial classifications according to their method of payment for medical detoxification services: Private, Medicare, Medicaid, Self-pay,

Uninsured and Other. Private health insurance included insurance provided by employer or obtained by direct payment from a private health insurance company. Self-pay included individuals not covered by any private or public programs or above mentioned sources. Payments from workers compensation, state and federal funded agencies were classified as Other.

Individuals were classified as multi-drug users according to their self-support of drug abuse: use of a single substance, or more than one substance at the moment of intervention. Relapse was defined as seeking and receiving detoxification services on more than one occasion during the three-year period under study. Length of Stay was recorded as the total number of days an individual stayed at the hospital during treatment.

Data analysis: All hypothesis tests were two-tailed, and statistical significance was assessed at the 0.05 level. Data that deviated significantly from normality were analyzed using non-parametric methods (Mann Whitney U test or Kruskal Wallis H test). Costs were calculated as 33% of charges based on Friedman, Mare, Andrews, and McKenzie estimation (Friedman et al., 2002) and costs by LOS. This model is based upon hospital characteristics and takes into account the number of beds, being a rural or urban setting, hospital type of ownership, and whether each hospital is a teaching or non-teaching hospital. All statistical analyses used SPSS 12.0. This study protocol sought and received appropriate approvals related to the protection of human subjects from the Institutional Review Board of the University of North Texas Health Science Center.

RESULTS

Sample description: One thousand three hundred thirty seven individuals seeking medical detoxification services were included in the analysis. The sample comprised of 42.8% women and 57.2% males (Table 1). More than half of the subjects in NHW, NHB and Hispanics, respectively, were between the 35 and 49 years old (Table 1). Subjects with Medicaid were more in number in all the three races, with the percentages being 30.5%, 45.9% and 35.1% in NHW, NHB and Hispanics, respectively. Hispanics were more likely to be uninsured compared to Other races, while whites were more likely to have private insurance and blacks used more Medicaid services (Table 1).

Table 1 about here

The mean cost by length of stay was higher for cocaine ($1044, p<.01), opioid ($815.5) and cannabis ($823.7) detoxification when compared to other drugs and was statistically significant. The mean total cost of detoxification services for cocaine ($2560.1) was significantly higher than those of other drugs (Table 2).

Table 2 about here

Findings in Table three indicate that subjects under amphetamine category with Medicaid had significantly higher mean and median costs of detoxification ($2,454.8 and $1,651, respectively) compared to Other.

Table 3 about here

In each individual drug detoxification, except for amphetamines, the mean and median length of stay has been reported to be less among the uninsured category compared to privately insured subjects. In addition, the cost by length of stay was also found to be higher in the uninsured group compared to those with private insurance. Subjects who were uninsured and abused alcohol had significantly higher median costs of detoxification ($2,144.6, p<.05) compared to Other (Table 4).

Table 4 about here

DISCUSSION

Non-Hispanic Blacks were more likely to be insured compared to NHW, mostly by public insurance, but this did not hold for Hispanics, who were about three times more likely to be uninsured compared to NHB. Traditionally the Hispanic population has been the minority group with the highest proportion of individuals without insurance. Multiple factors might be interacting to produce such phenomenon, such as illegal immigration status, low education attainment and low income, and temporary employment without health benefits. These factors have been considered as primary level barriers in Carrillo's model (Carrillo, Trevino, Betancourt, Coustasse, 2001).

The findings reported that Hispanics were more likely to be uninsured and have lower LOS. These findings could in fact indicate that uninsured Hispanics, as well as Hispanics on Medicaid, were being discharged earlier from this acute detoxification center, which was one of the primary access facilities to the healthcare system for most uninsured and Medicaid individuals with substance abuse. Early discharge of uninsured and Medicaid patients can be attributable to aggressive case management practices. This

in turn, can interrupt the normal course of care, and hinders timely access to further treatment, such as rehabilitation. In fact, the waiting period for the only public rehabilitation facility in the county was approximately 21 days (TCC, 2004).

In the United States, the estimated societal economic cost of drug abuse in 2002, which included health care costs, productivity losses and costs associated with criminal justice system, crime victim costs and expenses for administration related with social welfare system was $180.8 billion (ONDCP, 2004). Drug abuse is inextricably linked with the spread of infectious diseases such as HIV/AIDS, STD's, tuberculosis, hepatitis C, and is also associated with domestic violence, crime in the community, child abuse, accidents, teenage pregnancies and other adverse effects (U.S. Department of Health and Human Services, 2004). Furthermore, in 2002 there were 1.35 million inmates in US state and federal prisons, of which 329,000 or 24.4% were for drug offenses, and another 134,000 or 9.9% were for drug-related offenses (ONDCP, 2004).

For the period 1992-2002 the overall economic cost of drug abuse to society increased at a rate of 5.3% annually, from $107.5 to $180.8 billion (ONDCP, 2004). The consequences of alcohol and drug abuse show significant costs to Texas in medical resources used for treatment and care, reduced and/or lost productivity, law enforcement, destruction of property, and in motor vehicle accidents. The total economic costs of alcohol and drug abuse in Texas were estimated at $25.9 billion for 2000. Alcohol abuse cost has been roughly calculated to be $16.4 billion (63 %), while drug abuse or dependency was accounted for $9.5 billion (37 %), (Liu, 2000). In the same year, about $679 million was spent on specialty treatment services for alcohol and other drugs (Liu, 2000). An estimated $286 million was spent to treat clients primarily for alcohol abuse

and $393 million primarily for drug dependence. The 2000-2003 Consolidate Plan for the city of Fort Worth, Texas, has indicated that substance abuse was the most important reason for homelessness and emphasizes it as a high priority need (SAMHSA, 2005). Several limitations of the current study should be considered before conclusions are drawn. Two of the major concerns were about potential information bias due to self-reporting of drug abuse by patients, and failure to include substance abuse severity, and/or other medical conditions amongst patients that might have confounded our findings. In addition, other demographic and socioeconomic variables were not available, as this database was independent from the clinical and billing systems of the hospital. Finally, further in-depth analysis for confounding and interactions between variables is warranted.

Substance abuse is a major public health problem, it affects the health of a vast number of Americans, and results in remarkable costs to the healthcare system in the United States, and to society in general. The public health community must provide strong leadership in informing policy, advocating for needed research funds, and bringing practice in line with scientific advances in substance abuse prevention and treatment. Publicly funded treatment could pave the way. An effective strategy might consist of making significant improvements in the coverage and quality of substance abuse treatment under Medicaid and the Substance Abuse Treatment Block Grant Program, which currently requires insufficient accountability for the use of treatment dollars. Increased public coverage would reach the poorest populations, among whom the most chronic and complex drug users are most prevalent. At the same time, it is critical to improve the delivery of substance abuse treatments funded by Medicaid and the block

grants through the adoption of protocols and models based on proven methods. This

would enable providers to staff programs with an appropriately trained workforce, match

the length of treatment to the level of client impairment, and provide more

comprehensive and culturally competent services that are needed by individuals addicted

to drugs and alcohol.

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ABOUT THE AUTHOR

Alberto Coustasse, MD, MBA, DrPH, is a Research Assistant Professor at the
Department of Health Management and Policy of the School of Public Health at
University of North Texas Health Science Center at Fort Worth. His research interests
include healthcare disparities; hospital management, healthcare management, health
services research and pension systems.

Table 1: Demographic Characteristics and Financial Classification by Race in a Medical Detoxification Program, 2000-2003

Demographic Characteristics		Race	p		p		p		p
Sex, Age and Financial Classification	N=1337	Non Hispanic White		Non Hispanic Black		Hispanics		Other	
		N=928		N=268		N=94		N=47	
Gender by Percent	Females	42.80%	0.07	37.60%	0.14	42.60%	0.78	29.80%	0.1
	Males	57.20%		62.70%		57.40%		70.20%	
Age distribution % by race									
18-34		20.40%	<.01	15.30%	<.01	28.70%	0.19	36.20%	<.05
35-49		53.40%		63.80%		50.00%		34.00%	
50-64		18.00%		18.70%		17.00%		23.40%	
>65		8.20%		2.20%		4.30%		6.40%	
Financial Classification by percent within race			<.01		<.01		0.36		<.05
Private		27.70%		8.60%		25.50%		21.30%	
Medicare		25.20%		36.90%		22.30%		23.45	
Medicaid		30.50%		45.90%		35.10%		44.70%	
Uninsured		13.60%		7.80%		17.00%		4.30%	
Other		1.40%		0.40%		0.00%		6.40%	

* p values computed by Kruskal-Wallis test and Mann Whitney U test

Table 2: Cost, Cost by LOS and LOS in a Medical Detoxification Program, 2000-2003

		Cost	p Value	Cost/LOS	p Value	LOS	p Value
Cocaine	Mean	2560.1	<.01	1044	<.01	3.1	<.01
	Median	1822.1		667.1		3	
	SD	4994.5		3100.2		1.917	
Opioid	Mean	2696.4	.92	815.5	<.01	3.6	<.01
	Median	1979.2		670.7		3	
	SD	2532.1		711.6		2.4	
Alcohol	Mean	909.1	.61	2814.8	0.78	3.5	.58
	Median	736.8		2053.8		3	
	SD	786.4		3185.6		2.5	
Cannabis	Mean	2339.2	<.01	823.7	<.01	3.3	.633
	Median	1613.6		578.2		3	
	SD	1954.4		647.7		1.9	
Amphetamines	Mean	1821.6	<.01	760.8	.25	2.6	<.05
	Median	1429.3		627.2		3	
	SD	1260.2		441.1		1.3	
Sedatives	Mean	2505.1	.23	832	.34	3.2	.85
	Median	1852.5		593.5		3	
	SD	2696.4		851.8		1.4	

* p value computed by Kruskal-Wallis test and Mann Whitney U test

Table 3: Comparison of Cost, Cost by LOS and LOS by Drug Type by Private and Medicaid Insurance in a Medical Detoxification Program, 2000-2003

		Cost			Cost/LOS			LOS		
		Private	Medicaid	p	Private	Medicaid	p	Private	Medicaid	p
Cocaine	Mean	2416	2905.8	.51	890.9	1286	.58	3.1	3.2	.98
	Median	1999.3	1812.6		660.7	644.5		3	3	
	SD	1853.1	7348.5		684.1	4664.8		1.5	2.1	
Opioid	Mean	2492.6	2640.8	.96	813.6	794.5	.48	3.5	3.6	.89
	Median	1978.3	1956.6		618.7	686.6		3	3	
	SD	2200.1	2439.1		948.1	608.1		2	2.3	
Alcohol	Mean	2646.8	3032.4	.3	891.9	835.4	.84	3.4	3.8	.16
	Median	1905.3	1940		670.2	653.1		3	3	
	SD	3364.3	4250.3		1064.8	769.2		2.2	2.7	
Cannabis	Mean	3206.5	1805	.2	988.7	629	.71	3.8	3.1	.2
	Median	1783.6	1378		476.8	509.9		3	3	
	SD	2832.3	1026.5		867.1	389.8		2.2	1.3	
Sedatives	Mean	2346.7	3099.1	.89	691.5	1113.4	.48	3.5	3	.35
	Median	2080.1	1808.8		582.6	589.7		3.5	3	
	SD	1233.6	4398.3		254.8	1465.5		1.5	1.1	
Amphetamines	Mean	1246.5	2454.8	<.01	748.7	732.8	.81	2	3.4	.03
	Median	1236.2	1651		623	676.9		2	3	
	SD	353.8	1707.3		358.4	283.7		1.05	1.6	

* p value computed by Kruskal -Wallis test and Mann Whitney U test

Table 4: Comparison of Cost, Cost by LOS and LOS by Drug Type by Private and Uninsured patients in a Medical Detoxification Program, 2000-2003

		Cost			Cost/LOS			LOS		
		Private	Uninsured	p	Private	Uninsured	p	Private	Uninsured	p
Cocaine	Mean	2416	2651.1	.97	890.9	1158.1	.1	3.1	2.9	.17
	Median	1999.3	1748.1		660.7	910		3	2	
	SD	1853.1	2599.3		684.1	866.3		1.5	2.2	
Opioid	Mean	2492.6	3173.2	.65	813.6	1021.1	.14	3.5	3.47	.74
	Median	1978.3	2209.9		618.7	814.8		3	3	
	SD	2200.1	4016.3		948.1	816.5		2	2.4	
Alcohol	Mean	2646.8	2598.8	<.05	891.9	1182.3	<.01	3.4	2.8	<.05
	Median	1905.3	2144.6		670.2	1074.7		3	3	
	SD	3364.3	1384.05		1064.8	672.4		2.2	2.05	
Cannabis	Mean	3206.5	2474.9	.54	988.7	1393.4	.18	3.8	2.6	.1
	Median	1783.6	1892.4		476.8	1270.08		3	2	
	SD	2832.3	1179.05		867.1	885.87		2.2	1.9	
Sedatives	Mean	2346.7	1606.8	.42	691.5	794.49	.49	3.5	2.5	.44
	Median	2080.1	1606.8		582.6	794.49		3.5	2.5	
	SD	1233.6	791.1		254.8	357.6		1.5	2.12	
Amphetamines	Mean	1246.5	2206.8	.1	748.7	1197.5	.15	2	2.1	.69
	Median	1236.2	2007.2		623	964.4		2	2.5	
	SD	353.8	1236.7		358.4	796.7		1.05	0.98	

* p value computed by Kruskal-Wallis test and Mann Whitney U test