Organophosphate Poisoning and Suicide in Nepal: A Reflection on the limitations of Behavioral Health Resources

Tyler Johnston, MS1*, Kris Brickman, MD2, Roshana Shrestha, MD3, Anmol Shrestha, MD3 and Shaza Aouthmany, MD1

1College of Medicine, University of Toledo, USA
2Department of Global Health, University of Toledo, USA
3Kathmandu University of Medical Sciences, Nepal

*Corresponding author: Tyler Johnston, MS, Medical Student, College of Medicine, University of Toledo College of Medicine, 3000 Arlington Ave. Toledo, OH 43614, USA

Abstract

Background: Organophosphate poisoning is the most common cause of suicide attempt in Nepal. Mortality rates of organophosphate poisoning are 41 times higher than they are in the United States, even with appropriate treatment. In low middle income countries organophosphate poisoning is much more prevalent than any other forms of suicide due to the easy availability in these agricultural countries. The most common cause of organophosphate poisoning for intentional suicide is from depression. Social reforms within the country to address the stigma related to mental health problems and improved data collection on suicide information should lead to enhanced public health programs to address the underlying mental health problems facing this population.

Conclusions: The lack of mental health services in Nepal, compounded with a readily available means to carry out suicide, has bred an intentional OPP endemic in Nepal. It is imperative that federal regulations on organophosphate availability in a country that so heavily depends on its use for sustenance, be incorporated to combat it’s abuse as a means to carry out suicide.

Introduction

Organophosphates are the most commonly used form of pesticide in rural Asia, therefore is readily available in the local population of agricultural countries. Organophosphate pesticide poisoning is a prevalent emergency care problem found in Nepal. Since Nepal is primarily an agricultural country and organophosphate pesticides are prevalent throughout the region, poisoning is a much more common problem here as a low middle income country (LMIC) compared to more developed countries such as the United States. Worldwide there are approximately 3 million cases per year of organophosphate poisoning, which is almost uniformly from self-poisoning suicide attempts revealing a mortality ranging from 6 to 30% in LMIC [1-4].

Suicide has now become the number one cause of unnatural death in Nepal noting 5,317 people committed suicide in the fiscal year 2017-2018 [5]. It has been reported that there are nearly 15 suicides in Nepal each day according to Nepalese police [5]. The most common cause of suicide attempts are related to depression, but due to the social stigma of mental disorders these people are often untreated and there are limited public resources available for psychiatric conditions, such as depression and suicidal ideation [6,7]. There is a slight increase in predominance for men over women in these organophosphate suicide attempts, but suicide represents the number one cause of death for young females between 15 and 49 years of age [2]. In the most recent World Health Organization (WHO) report, Nepal ranks 7th in overall suicide globally [8], but is the 3rd highest country in suicide for women and the 17th highest for men [8].

There is a significant problem with underreporting of suicide and suicide attempts within the country. This is due to the common misconception that suicide at-
attemptstoilegalwithinNepal,thereforeattemptsare made to avoid any potential reporting to the police who areprimarilyresponsibleforcollatingthesestatistics withinthecountry[9].Infact,thereisnowlawagainst suicideattemptsbutthereclearlystillremainsasigniﬁcant socialstigmat.leadingtosocialisolationanddenigration ofindividualswithmentalandhealthproblems, includingdepression,psychoticdisordersandsuicidal ideations[2].Withorganophosphatepoisoningasthe cleareliderinutilizationforsuicideattempts,readyac- cess to this pesticide is the main reason that it has such anastronomicallyhigherincidenceinLMICcompared todevelopedcountriesthusuchastheUnitedStates. Or- ganophosphatesarenotreadilyavailableintheUSand cannotbeboughtoverthecounteratretailstores forpublicusebutcommonlyareavailablethroughout Nepal and other LMICs.

Discussion

OPPrepresentsapproximately0.9-1.0%ofthepa- tientadmissions to hospital emergency departments withinthecountry.Thiscomparesotherwisecidenceof approximately 1 out of every 2 million patients in the US presenting to emergency departments therefore realizing anincidence18,000timesgreaterinNehalthan intheUS.ThemanagementofOPPrequiressub- plementidentiﬁcationoftoxinandrapidadministrationofatropine tocounteractthecholinergiccrisisofOPP.Further managementrequiresequitablesupportivecareincluding IV ﬂuids, airwaymanagement, seizurecontroland Pralidoxime to reactivate acetylcholinesterase.

Suicidecontinuesto be a signiﬁcant but largely preventable public health issue in Nepal. The read- ily available organophosphate pesticides are the mostcommonformofsuicideattemptandpoisoning withinthecountry. As one of the leading countries in successful suicide throughout the world, particularly with a much higher incidence within the female population than most countries, a comprehensive national suicide-prevention program needs to be developed. In coordination with local civic and community leaders, the government of Nepal must develop clear action plans and interventions to address these socialculturalissuesleadingtothissigniﬁcantlyhigh suiderate. As Luitel, et al. explain in their Men- tal Health update in Nepal; Mental health problems are highly stigmatized in the community. No mental health awareness programs have been carried out in the public health system[10].

The lack of mental health services and stigmatization of suicide in Nepal have been a clear driving force of Organophosphate abuse as means to carry out suicide. In addition, Nepal’s status as an agrarian society has further facilitated the suicide endemic, making the herbicide readily available.

AgricultureremainsNepal’sprincipaleconomic ac-tivity,employing80%ofthepopulation[11].Incom- parison, less than 2% of the United States population farms. Yet in the United States, the U.S. Environmen- tal Protection Agency (EPA) has taken steps to limit the availability of organophosphate to the American public, askingmanufacturestorevoluntarilyeliminatetheusefor residential purposes due to its potentially hazardous side effects[12].SuchregulationsdonotexistinNepal, asorganophosphatescanbepurchasedlegallybyany- one,foranyreason.

Restrictedaccess to organophosphate pesticides needs to bестronglyconsideredtoreducetheavailabilityof thismostcommoncauseforNepalesesuicide.Further- more, national campaigns addressing the social stigma of depression, mental illness and other disorders could provide increased access to resources and healthcare programs with successful management of these disor- ders commonly leading to excessive suicide attempts within thecountry.

Conclusion

ThelackofmentalhealthservicesinNepal, com- pounded with a readily available means to carry out suicide, has bred an intentional OPP endemic in Nepal. It is imperative that federal regulations on organophos- phateavailabilityinacountrythatsoheavilydepends onitsuseforsustenance,beincorporatedtocombat it’s abuse as a means to carry out suicide. In addition, thereisverylimitedconsistencyinthereportingofsui- cide data within the country. Most of this comes from gathering policereports, but there must be collabora- tion and better communication among health admin- istration and police departments for accurate suicide information. This will lead to an improved and reliable data base on suicide mortality and attempts. Integration with healthcare facilities also is necessary to achieve reliable information on this critical topic.

Declarations

Note: Please complete all subsection under declara- tion section. Follow the format below:

Ethics approval and consent to participate

Not applicable.

Consent for publication

Manuscript was submitted to IRB for review and was waived by University of Toledo College of Medicine IRB.

Availability of data and material

Data sharing not applicable to this article as no da- tabases were generated or analyzed during the current study.

Funding

No funding was received for the publication of this manuscript.
Authors’ contributions

TJ was the Primary Author who cared of the patient in the Emergency Department and wrote the original manuscript. KB is also a primary author who performed the majority of manuscript revision work. RS, AS, and SA were all secondary authors who contributed in the for of revision and literature research.

Acknowledgements

Not applicable.

Competing Interests

The authors declare that they have no competing interests.

References


