

Study on Awareness of Persistent Organic Pollutants (Pops) Among Medical Professionals

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Abstract: Persistent organic pollutants (POPs) are toxic chemicals resistant to environmental degradation. Because of their persistence, toxicity and bioaccumulation, the effect on human and environmental health was discussed by the international community at the Stockholm Convention on Persistent Organic Pollutants. Study of awareness of Persistent Organic Pollutants among medical professionals, Validated questionnaires on Persistent Organic Pollutants were administered to 100 qualified medical practitioners of allopathic discipline and results analysed statistically based on scoring pattern. This study proves that awareness on POP s among medical professionals are very less amounting to about 26% only i.e. 1/3rd of the total medical practitioners who were included in the study. Persistent Organic Pollutants are one of the main cause affecting human health & environment. So, medical practitioners should be more aware of POP s to educate general population. More programs should be conducted on POP s to create awareness focussing on banning the use and production of POP s.

Keywords: POP s, Stockholm Convention, medical professionals, bioaccumulation, toxicity

INTRODUCTION

Persistent organic pollutants (POPs) are organic pollutants which are resistant to environmental degradation through chemical, biological and photolytic processes. Although some POPs arise naturally, most are man-made [1]. It is because of its

persistence, toxicity & bioaccumulation that the Stockholm Convention on Persistent Organic Pollutants was adopted in 2001 and entered into force in 2004 [6,7]. It is a global treaty aimed to eliminate and reduce the chemicals and to safeguard human health & environment from highly harmful chemicals affecting the wellbeing of humans as well as wild life [1, 4, 5]. Managed by the United Nations Environment Program (UNEP) and its Secretariat are based in Geneva, Switzerland. POP environmental contamination is extensive, and remains in these environments years after restrictions because of their resistance to degradation [2, 3]. The initial 12 POPs chemicals listed under the Convention include-aldrin, chlordane, DDT, dieldrin, endrin, heptachlor, hexachlorobenzene (HCB), mirex, toxaphene, polychlorinated biphenyls (PCBs), polychlorinated dibenzodioxins/polychlorinated dibenzo furans (PCDD/PCDF). They are known as “Dirty Dozen”, placing a global ban on these harmful

and toxic compounds requiring elimination and reduction of release of POPs in the environment.

AIM AND OBJECTIVES

Awareness on Persistent Organic Pollutants among medical professionals

MATERIALS & METHODS

Cross sectional survey based study. After consent, validated questionnaire responses on Persistent Organic Pollutants were collected from 100 qualified medical practitioners and results were analysed statistically. Questionnaires contain 29 correct answers, for each correct answer 1 mark was allotted. Scoring was done as percentage ($\% = \frac{\text{marks scored}}{29} \times 100$). People scoring more than 50% were considered as being aware of POPs.

Questionnaire for collection of information on Persistent Organic Pollutants

1. Are you aware of organic pollutants?									
Yes		No		Can't say					
2. Which among the following contribute for organic pollutants in the environment?									
Pesticides		Industrial Effluent		Biomedical waste		Heavy metals			
3. Have you ever heard of Persistent Organic Pollutants (POPs)?									
Yes		No		Can't say					
4. Which of these following chemicals are POPs?									
DDT		Malathion		Synthetic Pyrethroids		Dioxins		Lindane	
5. What are the basic characteristics of POPs?									
Water solubility		Toxicity		Persistence		Bioaccumulation			
6. Do you know that some POPs are being used in our day to day life?									
Yes		No		Can't say					
7. Are you aware that some POP chemicals bioaccumulate in our body and are found in human breast milk and blood samples?									
Yes		No		Can't say					
8. Do you think that uses of these POP chemicals are important for day to day life?									
Yes		No		Can't say					
9. Have you heard of Stockholm Convention on POPs? If yes, what is the source of information?									
TV		Friends		Internet		Newspapers		Others	
10. Are you aware of toxicological impacts of POPs?									
Yes		No		Can't say					
11. What among these are the likely toxic effects of POPs?									
Genotoxicity		Ecotoxicity		Teratogenic effects		All of these?			
12. Are you aware of endocrine disrupting chemicals (EDCs)?									
Yes		No		Can't say					
13. Select EDCs among the following?									
DDT		PCBs		Endosulfan		Alcohol			

RESULTS

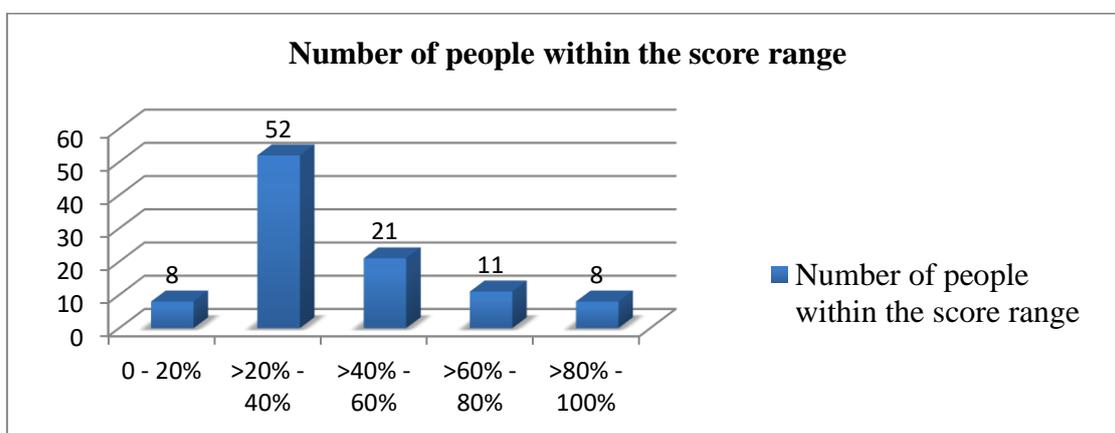


Fig-1: Number of people within the score range

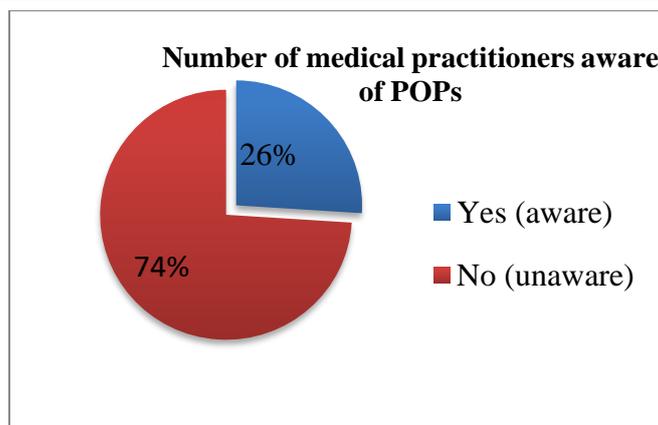


Fig-2: Number of medical practitioners aware of POPs

Table-1: Shows number of people within the score range

	0 - 20%	>20% - 40%	>40% - 60%	>60% - 80%	>80% - 100%
Number of people within the score range	8	52	21	11	8

DISCUSSION

Most of the respondent scored 20 – 40%. This study proves that awareness on POPs among medical professionals is very less amounting to only 26%.

Pollutants and the food chain are inter related by accumulating in the body fat of living organisms for long periods of time and it becomes more concentrated from one creature to another. The process is known as biomagnification [2,8]. Contaminants in small amount found at the bottom of food chain when biomagnify, brings about hazard to the predators feeding at the top of food chain. Farmed salmon also contains POPs in their fatty tissue and has been linked to diabetes in humans. It can be found in over 96% of obese individual.

Health effects of POPs are Endocrine disruption

A 2002 study [12] based on endocrine disruption and health complications from POP exposure showing low level exposure to POPs affecting health.

Reduced birth weight

It impaired the growth of fetus, reduced (birth weight, length, chest circumference & head circumference) [14,15].

Reproductive system

In males shows decreased sperm quality & quantity, early puberty onset. In females, altered reproductive tissues & pregnancy outcomes as well as endometriosis [13].

Neurological symptoms

Causes headache, dizziness, nausea, general malaise, vomiting followed by muscle twitching, myoclonic jerks & convulsions.

Cardiovascular disease

Higher concentration of POPs in high density lipoprotein.

Cancer

High concentration of POPs in low density lipoprotein and very low density lipoprotein.

Diabetes

Individuals exposed to low dose of POPs throughout their lifetime had a higher chance of developing diabetes than individuals exposed to higher concentration of POPs for a short duration of time.

The study shows most of the medical practitioners have less information regarding Persistent Organic Pollutants. Possibly the main reason for less awareness is due to its chronicity. Maintaining ideal body weight to avoid concentrated POP stores in adipose tissue. Lack of information through mass media such as television broadcast, radio, newspaper, magazines, etc to general population regarding the issue.

CONCLUSION

As less people are aware of POPs, more programs should be conducted to create awareness among the general population including medical professionals. Collaborative actions from different bodies such as Govt. , medical, food safety, educational

establishment, mass media, for awareness, banning, restriction of use, monitoring, alternative less toxic chemicals. Close monitoring of POP concentration in the food and environment.

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