ORIGINAL ARTICLE

AMALGAM WASTE DISPOSAL IN DENTAL HOSPITALS OF PESHAWAR

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ABSTARCT

The study was done to find out the methods for dispensing the dental amalgam and its disposal in three dental teaching hospitals of Peshawar according to American Dental Association (ADA) Standard and International Standard Organization Standard (ISO).

A specially designed questionnaire was sent for this study.

The results showed that none of the dental teaching hospital in Peshawar follows the ADA and ISO standard for the disposal and recycling the amalgam waste. Only 9 % claimed using the chair side traps and install amalgam separator at chair side, 64% used the hand mixing alloy / mercury procedure. Number of amalgam fillings done and removed by three dental hospitals per month were 2027 and 267 respectively. It was concluded that total amalgam waste was 3.204 kg in three dental hospitals in one year, and proper measures should be taken for the dispensing and disposal of amalgam.

Key Words: *Amalgam Waste, Disposal.*

INTRODUCTION

Silver amalgam is one of the oldest filling materials used in dentistry and mercury (Hg) as component of amalgam has been used for more than 15 decades.[1,2] By definition amalgam is a special type of alloy of two or more metals having mercury as an essential component [3] which may exposed either through incinerators or Hg in waste water from the different sources which could be either from households or dental clinics.[4] The dental amalgam particles are released from different sources and the waste of amalgam from dental clinic is one of them.[5] Mercury and its compounds are everywhere in our environment; between 2700 and 6000 tons of mercury is released annually from the oceans and the earth's crust. [6] These releases make the environment polluted through direct wastewater, incineration, land-filling and sewage sludge incineration. Less than 1% mercury is released from dental clinics of the total mercury discharged annually into the environment as a result of human activities.[7] A study conducted in 1973 showed that out of the 10,000 tons of mercury released by industry, approximately 300 tons came from dentistry from all over the world.[8] According to the environmental agency, the discharge of mercury by dental clinics is one of the factor that make environment unhealthy.[9-12] The International Dental Federation (FDI) and World Health Organization (WHO) in 1997 stated that dental amalgam [13] if not properly handled and regulated could be responsible for environmental pollution as well as occupational exposure.[14-20] For the best management of amalgam wastage American Dental Association (ADA) recommends the following;[21]

DO

- Use per-capsulated alloys and stocks a variety of capsules sizes.

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- Recycle the disposable capsules after use.
- Recycle salvage, non-contact and store amalgam (scarp amalgam).
- Recycle amalgam waste and the remaining amalgam pieces from restorations after removal.
- For retaining the amalgam use vacuum pump filters, chair-side traps, and amalgam separators procedure and recycling their contents as well.
- Recycle teeth which contain dental amalgam fillings. (Notes: Ask your recycler for disinfection).
- Recycling the amalgam waste as much as possible.
- For minimizing the dissolution of amalgam use line cleaners.

DONT

- Use mercury in bulk.
- Throw the capsules in biohazard containers (red bags) or garbage.
- Put non contact and contact amalgam waste in infections waste containers (red bags), biohazard containers, or regular garbage.
- Use drains or sinks for rinsing the devices containing amalgam.
- Dispose of the restorations in sharp containers or regular garbage.
- Flush the amalgam waste or its product down the drain or toilet.
- Use chlorine or bleach–containing cleaners to flush wastewater lines.

METHODOLOGY

A questionnaire was sent to three teaching dental hospitals in Peshawar, (Sardar Begum Dental College, Khyber College of Dentistry and Peshawar Dental College). The response was 100%. They were asked to inform which form of dispensing (Hand Mixing or Encapsulated), methods of disposing for amalgam waste and number of restorations performed and removed by the dental practitioners.

RESULTS

The overall response rate was 100%. According to the present study, 64% claimed using hand mixing dispensing method and only 1% showed their interest of using both forms of dispensing (Fig. 1). Number of amalgam fillings performed and removed by three dental hospitals per month are 2027 and 267 respectively (Fig.2). Method of disposing amalgam waste by bin has the highest percentage that is 67% (Table.1) and none of ISO standard procedure for controlling amalgam waste at chair side is used by any of the dental teaching hospitals (Table. 2).

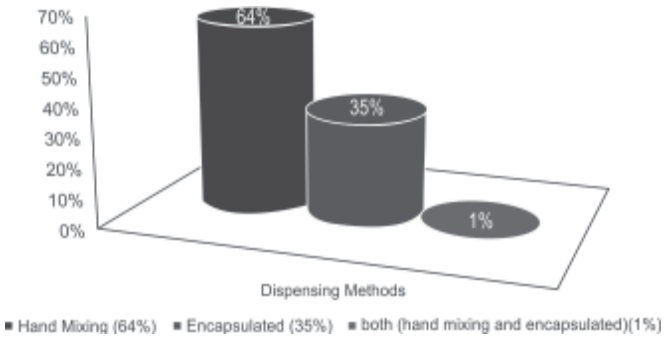

Fig 1: Percentage of dispensing methods

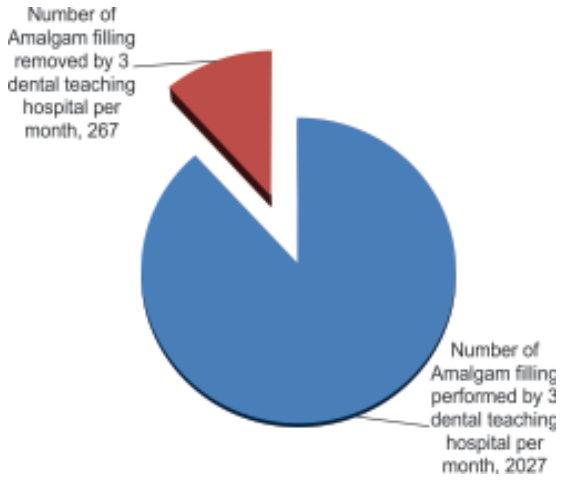

Fig 2: Number of fillings done and removed

TABLE 1: METHODS OF DISPOSING AMALGAM WASTE USED IN THREE DENTAL HOSPITALS

S. No.	Methods of disposing of amalgam waste	%
1.	Sink	29
2.	Photographic fix solution	1
3.	Bin	67
4.	Proper recycling method	5

TABLE 2: ISO PROCEDURE TO CONTROL AMALGAM WASTE AT CHAIR SIDE IN THREE DENTAL HOSPITALS

S. No.	ISO procedure to control amalgam waste at chair side	%
1	Amalgam separator	5
2	Chair side traps	9
3	Vacuum pump filters	7
4	None	77

DISCUSSION

Dentists and their staff members are exposed to mercury and its vapors daily. Mercury in elemental form may be absorbed through skin contact but inhalation of mercury vapors may be dangerous. The vapors are produced during mixing of the material and removal of old filling for replacement. Mercury, at room temperature is itself volatile. The mercury vapor has no color, odor or taste and cannot be easily detected. For mercury hygiene protocol needs to be proper layout of the dental clinics, trituration methods, condensation, cleaning and instruments sterilization, the removal of amalgam restorations and amalgam waste storage are also the matter of concern.[22] This study emphasizes that the 267 grams of mercury produced from the removal of old dental amalgam filling per month by three dental hospitals of Peshawar. The large number of teaching hospital preferred to use the hand mixing dispensation because of the cost saving, which may cause the chances of handling error. Therefore, it is not possible to achieve the proper control of amalgam waste. It can be overcome by the encapsulated dispensation. None of the dental hospital follows the ADA specification to control the amalgam waste.

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