



THE SHIFT IN DENTIST'S PERCEPTION AND ACCEPTANCE ON AMALGAM RESTORATION IN KASHMIR.

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ABSTRACT **AIM AND OBJECTIVE:** In spite of the long history of mercury amalgam as a dental restorative material, its use continues to be controversial. The notion of amalgam safety is questionable. A reduction in the use of dental amalgam in oral health care provision is expected across the developing countries.

MATERIAL AND METHOD: A survey was conducted in the form of a questionnaire and circulated among 210 dental practitioners through email. The response was collected, accumulated and analysed statistically.

RESULTS: A total of 150 (71%) dentists responded to the questionnaire that was emailed to them. 93% practitioners were males and only 7% were females. Only 10% of dental practitioners used Amalgam as a restoration material. 36% of the dental practitioners used only Glass ionomer cement. 54% of the practitioners used both composite restoration material as well as GIC material. 82.6% of the dentists knew about toxicity controversy of Amalgam.

CONCLUSION: Direct tooth color restorations are preferred and very popular among the dentists nowadays. Amalgam has also been a popular choice of restoration for the posteriors, for its remarkable strength. The level of acceptance toward amalgam appears to be related to economics, dental education, and aesthetic orientation of the patients as well as dentists.

KEYWORDS :

INTRODUCTION.

The dental public health strategies have been open to emerging diagnostic and treatment approaches all the time. In long term evaluation, the oral health of the public, the health of the dental practitioner and the practice of dentistry has been improved. In accordance with chronology, dentistry has developed gradually as a strong and respected profession based on sound science, a moral commitment of service to the public, and an ethical obligation to protect the health of the patient seeking dental treatment [1].

Dental amalgam has been widely used over 150 years ago as a dental restorative material, and has provided a valuable and relatively inexpensive service for patients ever since. It is made of two nearly equal parts; mercury and a powder composed of silver, copper, tin and zinc. The evidence obtainable suggests that dental amalgams are considered to be effective and safe; however, some concerns have been conveyed regarding the possible health effects of mercury in amalgam, contamination of the environment from mercury and treatment of its waste products [2,3].

The general acceptance of silver amalgam as a restorative material resulted from investigations of GV Black in 1895 on operative dentistry, which included detailed research into amalgam. His findings changed attitudes towards amalgam [4].

The amalgam controversy prompted authorities in some countries to formulate strategies and proposals on its phase out and future restrictions on its utilisation [5].

In spite of the development of the internet, television is still one of the most important sources of information where health issues are concerned. It can play a significant role in shaping public images about these issues. The Internet is now the main national and international source for noteworthy information especially about recent events, and many of the anti-amalgam websites contain considerable references to scientific data regarding mercury in amalgam and its effect on health. For patients not having a good or outstanding judgment and understanding, this makes the information all the more believable [6,7].

Restoration replacement may lead to removing of unnecessary amount of sound tooth structure, cavities enlarge and both the adjacent tooth structure and restorations become more liable to fracture during mastication. In most instances, teeth with previous complex

restoration, will not withstand successive restoration replacements without requiring endodontic treatment and/or an extra coronal prosthesis [8].

In fact, the placement of effective long-lasting restorations reduces the long-term cost of dental treatment [9].

Mercury vapour release from amalgam fillings into human mouth air after chewing becomes a source of mercury exposure, as displayed by whole-body image scan and tissue analysis. In an in vivo study done by Hahn et al., demonstrated that when radioactive Hg was mixed with dental amalgam and placed in teeth of mature sheep, this isotope appeared in various organs and tissue spaces within 29 days [10].

The last decade, however, there has been evidence of a shift away from the use of silver amalgam to more aesthetic tooth-colored restoration, mainly because of patient worry about the use of a mercury-containing filling material and partly because patients' perception of dental aesthetics appears to indicate that a proportion of the population are dispirited with the metallic colour of the restorations in their teeth [11].

Based on current evidence, provision of tooth-coloured restorations will be increasingly demanded, but a phase-out of virtually all usage of amalgam must be planned. Nevertheless, amalgam restorations may provide good longevity and involve less technique sensitivity in their placement than the alternatives [11,12].

Amalgam is still used by the dentists whether working in private dental offices or public hospitals, However its use has predominantly reduced to a very low level.

The aims of this study was to determine dentists' perception on amalgam restoration and its alternatives.

MATERIAL AND METHOD.

This study was a questionnaire based survey, with the survey sample of 210 dental practitioners from the region of Kashmir province. The questionnaire was closely related to the use of amalgam and was sent through the email to the dentists. Out of 210 emails sent, only 150 practitioners responded back to the questionnaire. This study was conducted between the months of February - May.

The questionnaire was divided into two sections. -Sections 1 asked about the personnel details of the practitioners i.e.

gender , graduation year, undergraduate or postgraduate.

-Section 2 asked practitioners about the materials and methods they employed in their restoration practice.

The data was collected , accumulated and well calculated in the forms of percentage , graphs, pie charts etc using statistics.

RESULTS

A total of 150 (71%) dentists responded to the questionnaire that was emailed to them.

97% practitioners were males and only 7% were females. Majority of the respondents (72%) were possessing the highest qualification of B.D.S and rest 28% were either postgraduate dentists or were undergoing their post graduation programme yet to be completed. 56% of dentists had less than 3 years of experience and 15% of dentists had less than 5 years of experience and rest 29% of the respondents had more than 5 years of experience. Only 10% of the respondents were using amalgam. Rest used GIC and composite restorative material. 82.6% of the dentists knew about the safety issue of the amalgam.

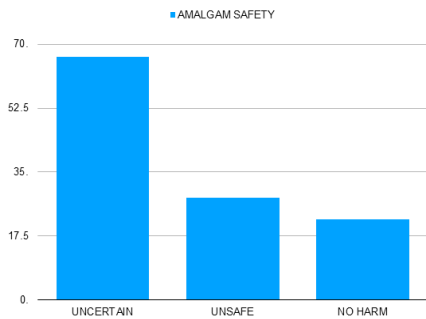
SOURCE OF KNOWLEDGE ABOUT THE AMALGAM CONTROVERSY:

Patients inquiries 8% Undergraduate education 46% Workshop and Conferences 10% IT(TV, internet) 12% Colleagues 9.5% Continuing dental education 14.5%

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DENTISTS' OPINIONS ON THE SAFETY OF AMALGAM FOR PATIENTS AND USERS:

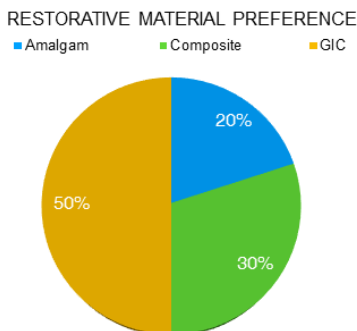
While majority of dentists 100 (66.6%) were uncertain about this issue, 28 (18.6%) believed that amalgam is unsafe for patients and users. Only 22 (14.6%) of the respondents indicated that amalgam presents no harm for the dentists and patients.



DENTISTS' AWARENESS OF THE CONTROVERSY CONCERNING AMALGAM SAFETY:

Nearly, only 124 (82.6%) of the respondents were aware of the controversy concerning amalgam safety and 26 (17.3%) were uncertain of it.

REPLACEMENT OF AMALGAM WITH TOOTH COLOR MATERIAL:



DISCUSSION

Mercury is highly toxic, especially when metabolized into methyl mercury. It may be fatal if inhaled and harmful if absorbed through the skin. Around 80% of the inhaled mercury vapour is absorbed in the blood through the lungs. It may cause harmful effects to the nervous, digestive, respiratory, immune systems and to the kidneys, besides causing lung damage. Adverse health effects from mercury exposure can be: tremors, impaired vision and hearing, paralysis, insomnia, emotional instability, developmental deficits during fetal development, and attention deficit and developmental delays during childhood. Recent studies suggest that mercury may have no threshold below which some adverse effects do not occur.

Dental amalgam is the most commonly used dental filling material. It is a mixture of mercury and a metal alloy. The normal composition is 45-55% mercury; approximately 30% silver and other metals such as copper, tin and zinc. In 1991, the World Health Organization confirmed that mercury contained in dental amalgam is the greatest source of mercury vapour in non-industrialized settings, exposing the concerned population to mercury levels significantly exceeding those set for food and for air [18].

According to a report submitted to the OSPAR Commission, in the United Kingdom, annually 7.41 tonnes of mercury from dental amalgam are discharged to the sewer, atmosphere or land, with another 11.5 tonnes sent for recycling or disposed with the clinical waste stream. Together, mercury contained in dental amalgam and in laboratory and medical devices, account for about 53% of the total mercury emissions. Waste incineration and crematoria are also listed as major sources of mercury emissions. Many countries, such as Armenia, Cameroon, Ghana, Honduras, Pakistan, and Peru, recognise the contributions from hospital thermometers, dental amalgams, hospital waste and/or medical waste incinerators but lack quantitative data. Despite the lack of data, there is good reason to believe that mercury releases from the health sector in general are substantial. Some countries have restricted the use of mercury thermometers or have banned them without prescription. A variety of associations have adopted resolutions encouraging physicians and hospitals to reduce and eliminate their use of mercury containing equipment [18].

To understand better the problem of mercury in health-care sector, it is recommended that countries conduct assessments of current mercury usage and waste management programs. WHO proposes to work in collaboration with countries through the following strategic steps [18].

Short-term: Develop mercury clean up and waste handling and storage procedures. Until countries in transition and developing countries have access to mercury free alternatives it is imperative that safe handling procedures be instituted which minimize and eliminate patient, occupational, and community exposures. Proper procedures should include spill clean up response, educational programs, protective gear, appropriate waste storage containment, staff training, and engineered storage facilities. Countries that have access to affordable alternatives should develop and implement plans to reduce the use of mercury equipment and replace them with mercury-free alternatives. Before final replacement has taken place, and to ensure that new devices conform with recommended validation protocols, health-care facilities will need to keep mercury as the "gold" standard to ensure proper calibration of mercury sphygmomanometers [18].

Medium-term: Increase efforts to reduce the number of unnecessary use of mercury equipment. Hospitals should inventory their use of mercury. This inventory should be categorised into immediately replaceable and gradually replaceable. Replaced devices should be taken back by the manufacturer or taken back by the alternative equipment provider. Progressively discourage the import and sale of mercury containing health-care devices and mercury use in health-care settings, also using global multi lateral environmental agreements to this end. Provide support to countries to make sure that the recovered mercury equipment is not pushed back in the supply chain [18].

Long-term: Support a ban for use of mercury containing devices and effectively promote the use of mercury free alternatives. Support countries in developing a national guidance manual for sound management of health-care mercury waste. Support countries in the development and implementation of a national plan, policies and legislation on mercury health-care waste. Promote the principles of environmentally sound management of health-care waste containing mercury, as set out in the UN Basel Convention on the Control of

Transboundary Movements of Hazardous Wastes and their Disposal. Support the allocation of human and financial resources to ensure procurement of mercury free alternatives and a sound management of health-care waste containing mercury [18].

World Health Organisation (WHO) recommends that the phase- down approach of dental amalgam should involve elevating of public awareness and careful planning. Dental practitioner will need to be made aware of the environmental impact of dental materials. Likewise, consultation with important stakeholders, governments, insurance companies and dental manufacturers is needed [13]. Dentists should consider patients attitudes, beliefs, and values regarding aesthetics and function when presenting treatment options. In the present study, although patients are more concerned with in clinical decision-making, they still rely on the dentist's expertise and advice.

Successful training of dental students and practitioners is based on research on the available and alternative dental materials. The directed programs on undergraduate training must better consider the safety of the environment, characteristics of dental amalgam and existing alternatives to amalgam for restorative dental care, development of skills in application of new quality materials for restoration, and the safety of dental restorative materials to the health care providers [14].

About 94 (50.8%) and 85 (45.9%) of the practitioners primarily used glass ionomer/resin- reinforced glass ionomer and composite respectively. These materials are more popular with patients. Patients' preferences based mostly on aesthetic reasons. Among the dentists in this survey, the use of indirect tooth coloured restorations was limited, possibly because of the higher cost and technique difficulties of these prosthesis.

Costs of materials vary between countries. Composites may be twice as expensive as amalgam and, as a result, the use of dental amalgam is still common. Some higher-income countries have introduced a ban on use of dental amalgam as a restorative material, taking into considerations the higher availability and accessibility of alternative tooth-coloured dental materials and different extra coronal prosthesis. Others have required or recommended dental practices to manage amalgam waste products so that they are not released to the environment. A large number of high income countries having introduced comprehensive preventive dental care. The application of silver amalgam has declined partly due to the fact that dental caries is less prevalent, caries lesions are less progressive and tooth structure loss is only minimum [15].

The use of questionnaire responses to determine dentists' attitudes and behaviour is common, although not without difficulties such as non-response bias [16,17].

CONCLUSION

While amalgam was the most common material used for posterior restorations, direct tooth- coloured restorative materials were also popular among dentists participated in this study. More than half of the dentists were aware of the controversy in regards to amalgam safety, only a minority of them believes that amalgam is not hazardous to dental personnel and patient's health, but pays more attention to patients' demand and satisfaction.

Awareness of toxicity of mercury in dental amalgam was slightly low among the patients seeking dental treatment studied. The majority of patients continue to accept amalgam, however among these maximum number are satisfied with the tooth color filling for more natural look. Overall acceptance toward amalgam appears to be related to economics, dental education, and aesthetic orientation of the residents. And this study also showed that, controversy related to amalgam restoration inspite of its pros has proven to lower down the use of amalgam as a restorative material among dental practitioners.

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