SYMPTOMATOLOGY

TMJ pain indicating cardiac disease

BACKGROUND

Myocardial infarction (MI) can be associated with a widely varying symptomatology. The most common symptoms are chest, shoulder, abdominal, upper extremity, and facial or jaw pain. Craniofacial involvement is likely related to afferent vagus nerve fibers transmitting nociceptive stimulation of the cervical neuron cells. A case involving a man with TMJ pain and dysfunction that turned out to be symptomatic of an MI was reported.

CASE REPORT

Man, 28, an active duty US Army soldier, reported to the oral and maxillofacial surgery (OMS) department to be examined for TMJ dysfunction and pain. He had left TMJ pain 3 months earlier and came to his dentist for help. The pain was worse when he exercised, especially heavy resistance training, but manifested sporadically. It radiated to his left mandibular and preauricular areas.

The dentist found no abnormalities in the patient's blood pressure, heart rate, respiratory rate, or temperature. The dental examination revealed a maximal incisal opening exceeding 45 mm without pain, deviation, or crepitus and with no restriction on motion. A hard night guard was fabricated and the patient was instructed in muscular physical therapy in the belief that the pain was myalgic and possibly related to bruxism. He was then referred to the OMS for further assessment.

A week before his evaluation, the patient collapsed while running during routine Army physical fitness training. He went into cardiac arrest, was defibrillated twice, and was brought to the emergency room. He eventually had a 1-vessel coronary artery bypass graft to address the 80% occlusion of his left anterior descending artery.

Three months after his cardiac arrest, the patient returned for evaluation. He reported immediate resolution of his jaw and face pain after the cardiac event, with no return since then. His oral and TMJ assessment revealed no significant findings, no evidence of functional restoration of movement, and no myalgic pain or bruxism.

DISCUSSION

MI occurs when the supply of oxygenated blood to the cardiac tissue is insufficient, leading to ischemia and the death of cardiac cells. Facial pain has been linked to ischemic heart disease, but evidence is lacking concerning the association of heart disease and other jaw problems.

Clinical Significance

This case reminds oral health care practitioners that, although most of the situations they face can be explained by odontogenic mechanisms, it's possible that a patient could have oral or facial pain related to nonodontogenic causes. In addition, even young, physically fit and active individuals can suffer cardiac disease. Dentists need to be vigilant about including in their differential diagnosis the possibility of uncommon causes being the culprit producing oral or facial pain.

Jenzer AC, Jackson H, Berry-Cabán CS: Temporomandibular joint pain presentation of myocardial ischemia. *J Oral Maxillofac Surg* 76:e1-2317.e2, 2018

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TELEDENTISTRY

Using teledentistry screening for advantaged children

BACKGROUND

Australia has experienced significant progress in improving oral health among its citizens, especially in reducing caries among children. The components of this progress include greater fluoride exposure and the school dental services (SDS) program. Many children who come from advantaged groups and are regularly seen by dental professionals are free of dental disease. In contrast, children from

disadvantaged backgrounds tend to experience higher rates of dental caries and more severe dental disease. As they continue to lack dental treatment, the gap between their dental health and that of the rest of the population widens. Early detection and regular dental screening programs can help to minimize the impact of caries and signal which children need close monitoring for caries development. A novel approach would be to use teledentistry to screen for caries, with a competent adult onsite using a smartphone camera to acquire dental photographs of the child's mouth, which can then be evaluated by a distantly located dental practitioner. A comparison based on a previous national cost-model study that evaluated teledentistry and visual dental examination to screen for dental caries among all school-aged children in Australia was done to determine the scale of resource savings that could be achieved by moving low-risk children from traditional visual examination to teledentistry screening.

METHODS

Data on children age 5 to 14 years were obtained from the Australian Bureau of Statistics. The data were divided into statistical local area (SA2), and cost models were estimated for teledentistry and for visual screening for each SA2 relative to the state, Remoteness Area (RA), and Socio-Economic Index for Area (SEIFA) indexes. Resource transfer scenarios, based on risk minimization, were developed and evaluated.

RESULTS

Analysis of Costs by State, Socioeconomic Status, and Remoteness

The 2.7 million children represented less than 12% of the entire Australian population. Across all of the Australian states except the Northern Territory, most of these children lived in major cities and inner regional areas. New South Wales, Victoria, and Queensland had a relatively equal distribution of children across the SEIFA deciles, but in South Australia over 60% of the children came from disadvantaged households and in Western Australia over 65% were from advantaged households. Ninety-eight million dollars, or nearly 75% of the estimated total budget for traditional screening, was spent in New South Wales, Queensland, and Victoria. If dental screening using teledentistry was used in these 3 states, the cost would be $40 million, a savings of $58 million.

When socioeconomic status was concerned, it was shown that most of the advantaged children (SEIFAs 6 to 10) lived in or near cities. Sixty-six million of the estimated budget for traditional screening, which is just under 50% of the estimated total budget for traditional screening, is spent on advantaged children. If teledentistry screening was considered per SEIFA decile, its average cost would be $5.5 million, which would cost $26 million for the screening of advantaged children.

The costs for dental screening increase directly with the increased remoteness of SA2s. Eighty-seven percent of the entire population of children in Australia live in the major cities or inner regional areas of the country. Depending on the remoteness, the cost of traditional screening was between $6 million for children living in R5 to $76 million for children living in R1. Traditional screening accounts for 55% of the total estimated costs across Australia. Teledentistry screening was between $0.5 million for children living in R5 to $35 million for children in R1. Those living in the major cities of Australia would consume less than 70% of the estimated budget for teledentistry screening.

Resource Transfer Model Analysis

If Australian advantaged children were moved to a teledentistry screening model, the total cost would be $26 million, which would reduce annual screening costs by $40 million. The savings in resources could then be used to address dental care for underserved children and/or those at high risk for caries.

New South Wales has the most advantaged children in Australia and they consumed $19 million for visual dental screening, or 48% of the proposed total budget for traditional screening in this state. If a teledentistry model of dental screening were used in New South Wales, screening costs would be reduced by $11 million.

Victoria, with the second-largest number of advantaged children in Australia, spends $15 million, or 53% of their total budget for traditional dental screening, on these children. If a teledentistry model were used for advantaged children in Victoria, the cost would be $7 million, which would save $8 million that could be spent on children who are underserved or at high risk for dental disease.

DISCUSSION

Health care systems are supposed to allocate their resources to provide each community with the care needed for those who live there. This review focused just on Australia, but dental health inequalities exist worldwide. If the use of teledentistry were directed to advantaged populations, who are likely to have no or minimal dental disease, not only would care expenditures be reduced, but greater equity would be achieved in the distribution of care resources. The optimal allocation of scarce resources and targeting care services to benefit high-need populations is a worthy goal for health care systems and should be carefully considered.

Clinical Significance

Resources should be distributed according to the need of the populations being served, especially the most vulnerable and remote-dwelling and most especially children, whose early diagnosis and treatment can have a lifelong impact. Public health initiatives and policies to help in reducing the inequalities that currently exist in providing dental care can be informed by studies such as this one.

Estai M, Bunt SM, Kanagasingam Y, et al: A resource reallocation model for school dental screening; Taking advantage of teledentistry in low-risk areas. *Int Dent J* 68:262-268, 2018

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