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Forensic Odontology

REALITY OF FORENSIC ODONTOLOGY IN SAUDI ARABIA.

A realidade da Odontologia Forense na Arábia Saudita.

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ABSTRACT

Saudi Arabia (SA), an oil rich developing country with a population of 31 million people, yet only 33% of whom are Saudis. Wealth, work opportunities and religious status make SA a hub for people from around the world whether it be through legal or illegal routes. As a developing country, SA faces many challenges in regard to mass disasters in light of its underdeveloped infrastructure and the annual Haj (Islamic pilgrimage) that attracts nearly 3 million people in a small area over a short period of time. Moreover, the numbers of unregistered births is high. These factors necessitate the importance of having a strong human identification and age estimation practice. Aim: To assess the reality of Forensic Odontology in Saudi Arabia in regard to: number of personnel and their training, number of forensic odontology cases and the way these cases are referred and documented. Materials and Methods: This project consisted of two parts: Observational study to assess how the system works in regard to forensic odontology cases, how these cases are dealt with and how they are referred. Part two: Cross-sectional survey aimed at all registered Forensic personnel to assess their qualifications, training, level of expertise, expert witness experience and involvement in specialized Forensic Odontology cases, namely: human identification, age estimation and bite mark analysis. Results: Out of 51 participants, only one dentist is registered with some form of Forensic training, 42 have a medical background, 39 of whom received medical Forensic training. Looking at forensic odontology in particular, only 11 out of 51 have had Forensic Odontology training. Participants who don't have any training in Forensic Odontology, yet have worked on cases that required Forensic Odontology training, were 37 on age estimation cases, 27 on bite mark analysis and 36 on human identification cases. There are no designated programs on Forensic Odontology in Saudi Arabia, nor is there a Forensic Odontology entity. There are no clear national guidelines or protocols to personnel when dealing with forensic cases and no detailed forms that documents oral findings. Conclusion: There is no solid Forensic Odontology system in Saudi Arabia that is objective, preserves the integrity of the law and protects human rights. There are many areas that can be improved to achieve that aim and a list of recommendations is presented.

KEYWORDS

Saudi Arabia; Forensic dentistry; Bites and stings; Expert witness; Age estimation by teeth.

INTRODUCTION

Saudi Arabia (SA), an oil rich developing country with a population of 31 million people, yet only 33% of whom are

Saudis according to the census of 2015¹.

Non-Saudis mostly have legal visas, yet a minority live illegally².

Cities and villages are scattered over an area of 225 thousand km², with deserts making up most of it. SA spans from the red sea in the west to the Arabian Gulf in the east along with Gulf States (Kuwait, Bahrain, Qatar, United Arab Emirates and Oman). In the north, it shares borders with Iraq and Jordan, and in the south it shares borders with Yemen and Oman. The two holiest cities in Islam are in SA, Makkah and Medina, with over than three million pilgrims performing Hajj in a small area over a period of seven days. Moreover, religious tourism attracted over four million visitors from other countries between January 2014 and May 2014^{3,4}, some of whom remain illegally in the country.

Wealth, work opportunities and its religious status make Saudi Arabia a hub for people from around the world. Although immigration is illegal⁵, many people try to enter the country illegally from neighboring troubled countries and from Africa. The latest records in 2014 reveal that there are 194,520 illegal immigrants⁶.

In 2000, Saudi Arabia introduced the digital security system for all citizens over the age of 15, where each citizen has to have an identification card issued with his or her 10 fingerprints stored in a national database. This is depending on having a birth certificate, yet according to the UNICEF, the percentage of unregistered births is still high in the Middle East⁷. Non-Saudis have their fingerprints taken when they apply for the visa and checked at the point of entry and exit.

Although Saudi Arabia has a relatively low crime rate⁸, it is still faced with challenges in regard to human identification

and age estimation because of the underdeveloped infrastructure and being a target for terrorism.

Mass disasters, such as terrorist attacks⁹, the mass fire and stampede of the Hajj and the Jeddah floods in 2005¹⁰, along with the unregistered births in rural areas and numbers of illegal immigrants, which is on the increase, necessitate the importance of having a strong human identification and age estimation practice.

Importance of forensic odontology

Forensic odontology involves the management, examination, evaluation and presentation of dental evidence in criminal or civil proceedings, all in the interest of justice^{11,12}. There are three main branches of forensic odontology:

A) Human identification

Identifying an unknown individual, dead or alive, is the most common role of the forensic dentist. The identification process can be performed either by comparing ante- and post-mortem dental records to establish (to a high degree of certainty) that the remains of a decedent and a person represented by are the same individual; or by suggesting characteristics of the individual¹³. The unique nature of the dental anatomy and the placement of custom restorations ensure accuracy when the techniques are correctly employed¹⁴.

B) Age estimation

Age estimation plays an important role in mass disasters and unaccompanied/asylum seeking minors in the absence of proper documents. It also

contributes in anthropology and forensic sciences, where age at death is estimated for skeletal remains¹⁵. Teeth survive inhumation well and show less variability than skeletal age and the developing dentition is therefore better than other developmental indicators available for age estimation¹⁶⁻¹⁸.

C) Bite mark analysis

The human dentition is unique to each individual. This feature could be used to exclude a suspect if a bite mark is present¹⁹. Bite marks observed on skin or food can be compared with a dental model taken from the suspect or victim²⁰.

The importance of Forensic Odontology and the challenges facing Saudi Arabia make it of paramount importance to shed the light on the reality of Forensic Odontology practice in Saudi Arabia.

JUSTIFICATION

This paper is the first to explore the reality of Forensic Odontology in Saudi Arabia in depth, highlighting the impact on human rights and the judicial system when having untrained personnel deal with Forensic Odontology cases and can even be expert witnesses. As shocking and controversial this research paper is, as important it is because it gives recommendations for improvement. The reality is Saudi Arabia is not unique and this paper opens the door to other researchers in other countries to critically appraise their systems. This paper is a step towards a better future that preserves human rights.

AIM

To assess the reality of Forensic Odontology in Saudi Arabia in regard to: number of personnel and their training, number of forensic odontology cases and the way these cases are referred and documented and who deals with them or be an expert witness.

MATERIALS AND METHODS

The research proposal was registered in collage of dentistry research center and approved by the ethical committee (IR 0087). This project consists of two parts:

Part one: (Observational study)

Letters were issued to officials in the Ministry of Health (MOH), Saudi Commission of Health Specialties (SCHS), medical services in the Ministry of Interior (MOI), Forensic department in king Fahd security collage (KFSC) and criminal evidence (CE). Face-to-face interviews were organized to assess how the system works in regard to forensic odontology cases, how these cases are dealt with and how they are referred.

Two researchers conducted the face-to-face interviews with the Head of Forensic department at (KFSC), the Head of Forensic department at (CE) and the General director of forensic medicine at (MOH).

The interviews focused on the system of dealing with forensic cases in detail and all official forensic forms were collected.

Part two: (Cross-sectional survey)

A survey consisting of 16-question aimed to all registered Forensic personnel assessing their qualifications, training, level of expertise, expert witness experience and involvement in specialized Forensic Odontology cases: human identification, age estimation and bite marks analysis.

The survey was distributed to all registered forensic personnel in Saudi Arabia (SCHS) by hand and an electronic version was sent by email. A follow up by phone was also done.

RESULTS

There are 127 registered Forensic Personnel in Saudi Arabia. Only 51 filled the questionnaires fully.

Forensic Odontology training

There are no designated programs on Forensic Odontology in Saudi Arabia. The only training available is two hours in the third year of the four-year forensic medicine residency program. The content of these lectures, however, is up to the lecturer with no assigned textbook or reference in the curriculum and the course outline. Moreover, the scope of these lectures of Forensic Odontology applies only on the living.

Forensic Odontology entity

There is no Forensic Odontology society or association in Saudi Arabia and there is no Forensic Odontology section in the Saudi Society for Forensic Medicine.

The legislation of forensics in Saudi Arabia

The Ministry of Health assumes the responsibilities of technical supervision on the forensic performance and activities taking place throughout the Kingdom, and issues explanatory instructions and procedures aiming to guide forensic doctors and enable them to optimally take over their duties, and it is the main legislator of forensics in Saudi Arabia. The second legislator is the Ministry of Interior. It carries out the investigations, arrests of the perpetrators and the establishment of claims before the competent courts.

There are, however, no clear national guidelines or protocols to personnel when dealing with forensic cases (Photographs, Radiographs, descriptive report or methods to be used), each department establishes their own protocol. Hospitals do not have protocols to report or document cases that arrive to the emergency. There are no standardized report forms to describe the details to the court. Moreover, reports are sent to the court (directly to the judge) without the need for the expert witness to attend. References to methods used by the expert are not required to be included in the report, nor does the degree of accuracy or limits of the method. Moreover, age estimation reports do not have a minimum and maximum range of the estimation or the method used to reach that estimation.

Official forensic forms that documents oral findings are in Arabic and do not include the complete dental status in details. Tooth abbreviations, color distinction, supplementary examination, types of radiographs taken, methods used in the analysis are not documented (Figure 1).

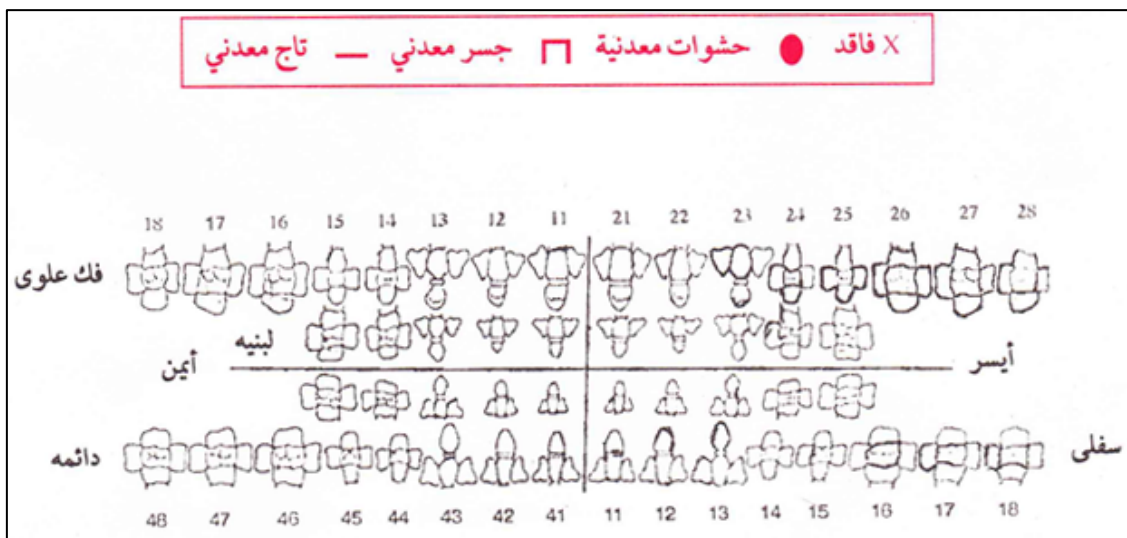


Figure 1. Dental chart in Arabic used in Forensic case documentation. The chart shows Upper and Lower Jaws as well as Right and Left sides labeled. Permanent and Deciduous Dentitions are labeled and numbered based on the International notation system for the permanent teeth only. (– Metal crown, □ Metal Bridge, ● Metal filling and X is missing tooth).

Forensic personnel

There are 20 Forensic centers dispersed across 13 districts in Saudi Arabia. The registered forensic personnel are 127 (SCHS) only 2 dentists according to the list, all of whom received an electronic survey but only 51 answered the survey fully.

Out of 51 participants who filled the questionnaire, 42 have a medical background, 39 of whom received some form of Forensic training. Two have a dental background but only one received Forensic training. Lastly, seven have a background in pharmacy, six of whom with some form of forensic training.

There are 44 out of the 51 participants working in forensic departments,

30 out of whom have forensic training programs in their centers.

There are 25 participants over the age of 40 with more than five years of experience in forensic practice. On the other end, there is only one younger than 25 years of age with less than 3 years of experience.

Looking at forensic odontology in particular, only 11 out of 51 have had Forensic Odontology training. In regard to their backgrounds: eight medical, one Dental and two with a background in pharmacy. These 11 personnel have worked both on general Forensic cases and on cases involving human identification, age estimation or bite mark analysis (Figure 2).

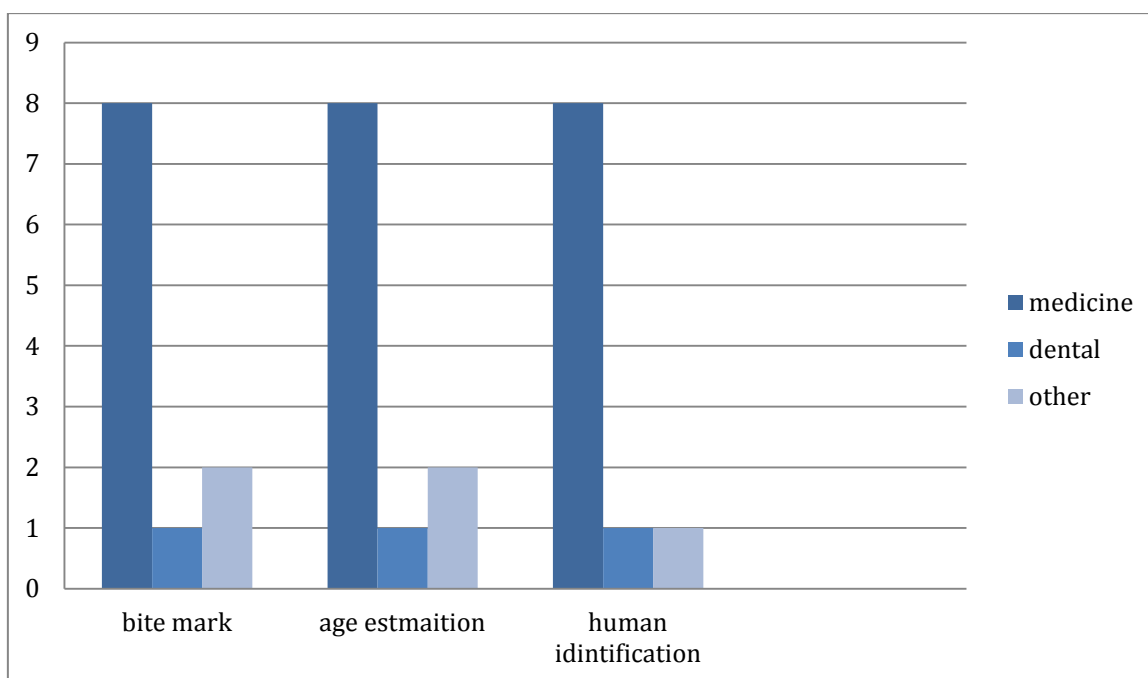


Figure 2. Number of registered Forensic personnel who have worked on Forensic Odontology cases according to their background.

Out of the 51 registered individuals, 46 have had forensic training and worked on cases. However, five registered individuals have not been trained in either medical or dental forensics, yet worked on forensic cases.

Participants who don't have any training in Forensic Odontology, yet have worked on cases that requires Forensic Odontology training, were: 37 on age estimation cases, 27 on bite mark analysis and 36 on human identification cases (Figure 3).

There are 25 out of the 51 participants who have had the chance to be an expert witness in Forensic Odontology cases. Twenty three have more than five

years' experience. From all the expert witnesses, only eight have had some form of training in Forensic Odontology.

Participants, who were expert witnesses in Forensic Odontology cases without any training in Forensic Odontology, yet have dealt with age estimation and human identification cases were 17 individuals, and 15 have worked on bite mark analysis. Unfortunately, no dentist has been an expert witness in Forensic Odontology cases.

When the participants were asked if they thought that there is a need for a Forensic Odontologist in their center, 44 said yes, 10 of whom having some form of Forensic Odontology training.

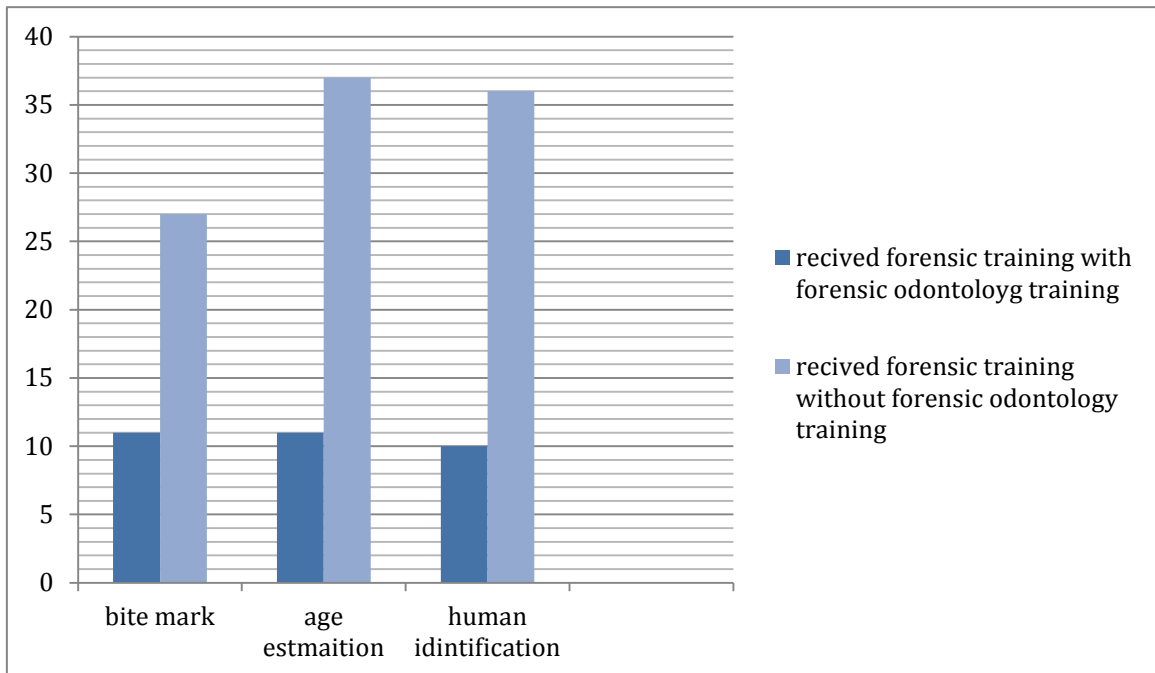


Figure 3. Number of registered Forensic personnel who have worked on Forensic Odontology cases according to their training.

DISCUSSION

There were some difficulties encountered in doing this research. Cooperation of the Ministry of Health was limited and actual case numbers were not disclosed. Therefore establishing the number of Forensic Odontologists needed could not be established.

The lack of training in Forensic Odontology and the absence of a governor body to this arm of Forensic science is impeding its advancement and affecting its integrity. The absence of protocols and guidelines are manifestations of this gap, which replicates on the veracity of the law. Having an entity that deals with the legislation of Forensic Odontology is of paramount importance, not only to regulate and monitor the practice, but also to make sure that human rights are preserved.

Many countries have Forensic Odontology societies or at least sections in

Forensic Societies, which are in turn part of international societies, to develop national documents and protocols for personnel to maintain the objectiveness of the practice. Having this umbrella not only help regulate matters, but also help in keeping up with advancements in the field and changing the guidelines and protocols to be in line with new evidence²¹.

Exploring the reality of Forensic Odontology in Saudi Arabia revealed that there are two entities that deal with Forensic cases^{5,21}, yet there is no unified database. Moreover, all forensic cases that pass through the MOH are recorded in the MOI, but the reverse is not true although the MOH is the main Forensic backbone in the country. This situation is the result of not having an independent entity of Forensics, where all cases could be presented and analyzed, then referred to the appropriate channels. This absence of boundaries led to

difficulties in regulating the practice and the personnel involved.

The absence of designated Forensic Odontologists necessitated the use of Forensic Medicine professionals or general Dentists to deal with Forensic Odontology cases, regardless of their lack of Forensic Odontology training. They sometimes end up being expert witnesses in court, which is in violation of the Saudi law²².

Only one general Dentist has had some form of Forensic Odontology training. This lack of numbers makes it difficult to reform and implement evidence based guidelines. The combination of the low number of qualified Forensic Odontologists and the lack of standardized reporting system and forms lead to the quality and integrity of Forensic legal reports to be compromised.

This project has shed the light on the reality of Forensic Odontology in Saudi Arabia and emphasized the areas that can be, and should be improved: training, legislating, numbers of specialists and a unified reference entity.

Just recently, a new Clinical Forensic Odontology Unit has been established in the college of Dentistry, King Saud University. A lot is expected from this unit where it should be the seed for future change, especially in training, guiding and supporting the system.

CONCLUSION

There is an urgent need to have a solid Forensic Odontology system in Saudi Arabia that is objective, preserves the integrity of the law and protects human

rights. There are areas that can be improved to achieve this aim.

RECOMMENDATIONS

- Establish a forensic odontology program (diploma, masters or board) under the supervision of the Saudi commission of health specialties.
- Add structured basic training in forensic odontology into forensic medicine program in Saudi board as soon as possible.
- The forensic odontology lectures in the Saudi forensic board should be outlined clearly and referenced. Preferably presented by a Forensic Odontologist and should involve basic clinical training for the living and the dead.
- Organize a forensic odontology workshops for all forensic personnel registered in Saudi commission of health specialties.
- Establish a forensic odontology society or at least a section in Saudi Society for Forensic Medicine.
- Draft clear protocols to deal with and report forensic odontology cases
- Develop a mechanism for reporting and documenting forensic odontology cases that arrive to the emergency departments across the country.
- Apply standardized forensic odontology report forms.
- Expert witness report should include all references of methods used and degree of accuracy and range of biological differences.
- Administering INTERPOL dental charting form for identification and maintaining their integrity by filling them in details.

- Provide Forensic Odontologist positions as soon as possible in main centers.
- Form a national database for all forensic odontology cases.
- Encourage courts to have experts attend the court to give their opinion.
- Apply a network connection between MOH and MOI to make dealing with cases easy and fast.
- Cooperate with forensic odontology unit in King Saud University to improve the education and to improve the skills.
- Establish an independent forensic Organization that connects MOI, MOJ and MOH.

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RESUMO

Arábia Saudita, um país desenvolvido e rico em petróleo, com uma população de 31 milhões de habitantes, onde apenas 33% das pessoas são sauditas. Riqueza, oportunidades de trabalho e situação religiosa faz do país um centro de atração para pessoas de todo o mundo, tanto por rotas legais como ilegais. Como um país em desenvolvimento, enfrenta muitos desafios relacionados a desastres em massa em virtude de uma infraestrutura subdesenvolvida e o *Haj* anual (peregrinação islâmica) que atrai aproximadamente 3 milhões de pessoas em uma pequena área durante um curto período de tempo. Além disso, o número de nascimentos não registrado é alto. Nesse sentido, todos esses fatores reforçam a importância de um sistema de identificação humana e estimativa de idade eficientes. Objetivos: Avaliar a realidade da Odontologia Legal na Arábia Saudita em relação à equipes e treinamento que recebem, número de casos envolvendo a Odontologia Legal e como esses casos são conduzidos e documentados. Material e Métodos: a metodologia consistiu em dois momentos – estudo observacional para avaliar como o sistema funciona com relação a casos envolvendo a Odontologia Legal, como esses casos são conduzidos, analisados e referenciados. Em outro momento, um estudo focado em todo o pessoal de área pericial para avaliar sua formação e qualificação profissional, treinamento, experiência e envolvimento com casos de Odontologia Legal envolvendo identificação humana, estimativa de idade e análise de marcas de mordida. Resultados: dos 51 participantes, apenas um cirurgião-dentista está registrado com algum treinamento forense, 42 têm formação médica, dos quais 39 receberam treinamento forense na área médica. Analisando a Odontologia Legal, de maneira particular, somente 11 dos 51 participantes tiveram treinamento em Odontologia Legal. Dos participantes que não tiveram nenhum treinamento em Odontologia Legal, mas trabalharam em casos que necessitavam de tal especialidade, 37 foram casos de estimativa de idade, 27 casos de marcas de mordida e 36 casos de identificação humana. Na Arábia Saudita não há nenhum programa voltado para a Odontologia Legal e nenhuma entidade oficial nessa especialidade. Não há protocolos claros para as equipes forenses quando envolvidas em casos odontológicos, bem como formulários para achados odontológicos. Conclusão: Não há um sistema estruturado em Odontologia Legal na Arábia Saudita que seja objetivo, juridicamente embasado e que proteja os direitos humanos. Há muitas áreas que precisam ser melhoradas a fim de atingir a lista de recomendações apresentada.

PALAVRAS-CHAVE

Arábia Saudita; Odontologia legal; Mordeduras e picadas; Prova pericial; Determinação da idade pelos dentes.

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