Preliminary assessment of dental practice risk during Covid-19 pandemic: a case-control study

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Abstract

Objective: The aim of this study was to assess the risk of dental practice during Covid-19 pandemic. Method: This is a retrospective case- control study conducted in Iraq from 24 February to 10 April 2020, eligible case (693) patients and the control group (693) patients randomly. Results: Total number of the sample was 1386 (case 693, control 693 patients), the exposure (dental practice) were 7 (0.5%) patients, 3 (0.21%) of them were positive (+ve) while other 4 (0.288 %) were negative (--ve) result. Mean age for case group 42.4 years and for control group 38.7 years. For case group 418 (61%) males, 275 (39%) females and for control group 402 (58%) males, 291 (42%) females. Odds ratio (OR )1.335 at confidence interval (CI) 95% (0.298-5.988) that mean possible associated risk is present but at this confidence interval it is statistically not significant. Clinical significance: The use of PPE with strict adherence to infection control measures can significantly minimize the risk of Covid-19 infection during dental practice.

Keywords: COVID-19, dental practice, nCOV


Introduction

In December 2019, patient with pneumonia of unknown etiology was reported in Wuhan, Hubei, China. Rapid transmission of disease was observed in China, the investigations revealed the causative pathogen was viral which is thought that Chinese horseshoe bats being the most probable origin. On 7 January 2020 was named the Novel Corona virus (nCoV) by Chinese researchers. On 12 January 2020, the World Health Organization (WHO) named this new virus 2019-Novel Corona virus (2019-nCoV). The infectious disease was announced as Covid-19 by WHO on 11 February 2020 [1-2]. On January 30, 2020, WHO announced that this outbreak had constituted a public health emergency of international concern [3]. On March 11, 2020, WHO declared the novel corona virus disease 2019 (Covid-19) a global pandemic, which classifies the outbreak as an international emergency [4]. Iraq's first confirmed Covid-19 case was discovered in city of Najaf on 24 February 2020. In Iraq from date of first case registration till 10 April 2020, 1279 confirmed cases with 70 deaths from the whole country. Interpersonal transmission has been proved in hospital, dental, and family setting. According to the 6th Edition of Covid-19 Treatment Regimen (Trial Implementation) published by the National Health Commission of the People’s Republic of China (2020), the possible routes of Covid-19 transmission are direct contact and droplet transmission [5]. Another important route of transmission is (Aerosol) which can be low level such as talking or high level such as cough and sneeze from infected patients in a relatively closed environment [6]. In dentistry close contact setting and aerosol generating procedures rank the dentistry as a high occupational hazard [7]. There is lack and dispersed knowledge about Covid-19 with no consensus regarding optimum infection control for dental practitioners; therefore we have conducted a study from 24 February to 10 April 2020 to assess this association. The aim of this study was to assess the risk of dental practice during Covid-19 pandemic management.
Patients and methods
This retrospective case-control study reviewed the records of Iraqi patients (Kurdistan region excluded) between 24 February 2020 and 10 April 2020 from Iraqi Ministry of Health (MOH) and Iraqi Dental Association (IDA) data base. This study was approved by institutional review board NO. 54 in 24/2/2020 data was taken and registered by the medical member blindly about personal information, signs and symptoms, time of incubation period 2-14 days. Eligible case included (693) patients consecutively selected and confirmed diagnosis with Covid-19 by polymerase chain reaction (PCR). The control group included (693) patients randomly selected and confirmed with negative PCR test for covid-19 from the same governmental laboratories from which the case patients were enrolled.

Definitions
Case: any patient PCR positive (+ve) for covid-19 in governmental laboratories between 24 February 2020 and 10 April 2020, their age 23-63 years.
Control: any patient PCR negative (-ve) for covid-19 in governmental laboratories between 24 February 2020 and 10 April 2020, their age 23-63 years.
Exposure: dentist practices in Iraqi MOH aged between 23-63 years from 24 February 2020 to 10 April 2020 with +ve or -ve Covid-19 PCR.

Data collection
Data were collected from reviewing data base records of Iraqi MOH and IDA, and personal communication to obtain demographic information, and PCR test results for each patient from medical member who was presented in public laboratories.

Guidelines for dental care providers during Covid-19 pandemic
World Health Organization guidance on infection prevention and control strategies for use when COVID-19 is suspected adapted from WHO’s Infection prevention and control during health care for probable or confirmed cases of Middle East respiratory syndrome coronavirus (MERS-CoV) infection, based on current knowledge of the situation and experience with severe acute respiratory syndrome (SARS) and MERS. MOH adapted these recommendations [8] to be used in dental Clinics during Covid-19 pandemic, figure (1).

Statistical analysis
Data was presented as number, percentage, and mean. Odds ratio (OR) and 95% confidence interval (CI) was used to determine whether the risk factor (dental practice) associated with an increased risk of developing Covid-19. Statistical analysis was done by using IBM SPSS. Statistics for Windows, Version 24.0

Results
Total number of the sample was 1386 (case 693, control 693 patients), the exposure (dental practice) were 7 (0.5%) patients, 3 (0.2%) of them were +ve while other 4 (0.288%) were negative (-ve) result. Mean age for case group 42.4 years and for control group 38.7 years. For case group 418 (61%) males, 275 (39%) females and for control group 402 (58%) males, 291 (42%) females. Odds ratio (OR) 1.335 at CI 95% (0.298-5.988) that means possible associated risk is present but at this confidence interval it is statistically not significant, figure (2).
Discussion

This study was aimed to assess the possible risk of dental practice association with Covid-19 infection under use of the WHO guidelines during Covid-19 pandemic, sometimes distance between operator dentist and the patient was less than 25 cm especially in the indirect technique. The association between this occupation and Covid-19 was statistically not significant (OR 1.335 at CI 95% 0.298-5.988). Dental practice still carry occupational hazard due to specific nature of this practice in term of procedure that deal with saliva, blood, and other body fluids as well as close contact with patient [9]. Lu et al. 2020 reported that Covid-19 transmitted mainly by two routes including direct transmission (cough, sneeze, and droplet inhalation transmission) and contact transmission (contact with oral, nasal, and conjunctiva) [10], therefore, all elective dental procedure were postponed and treatment confined only for emergency cases in an attempt to minimize crowding of patients in dental institutions as it is well reported that close contact with patients with symptomatic and asymptomatic Covid-19, including health care workers and other patients in the hospital increases risk of Covid-19 infection. In study of 138 hospitalized patients with Covid-19 in Wuhan, 57 (41%) were suspected to be infected in hospital, including 40 (29%) health care workers and 17 (12%) patients hospitalized for other reasons [11]. It is recommended to maintain spatial distance at least 1 meter between patients in good ventilated room in average of 60 L/s. It is important to decrease dental interventions which many of them are aerosol generating procedures and to save the health resources during pandemic [12]. During pandemic the health institutions suffer from pressure on human resources and shortage in medical equipment [13] that necessitate reduction of health care providers in dental hospitals to the lowest number in addition to minimize chance of cross infection between staff. In spite of lack of resources like personal protection equipment (PPE) during Covid-19 outbreak, its providence is essential and not negotiable, figure (3).

At present, there is no international consensus on guideline for protection of dental practitioners from Covid-19 infection. Since the main route of spread of Covid-19 is the airborne droplet transmission, especially in dental clinics and hospitals, PPE including protective head caps, goggles, face shields, masks, gloves, and gown is highly recommended for all healthcare providers in the clinic/hospital settings during pandemic. In a recent study conducted in Hong Kong Covid-19 was detected in saliva at high titers [14] therefore first line of treatment is pharmacological if no urgent condition is present otherwise any dental intervention that produces aerosol such as tooth sectioning should be avoided and acute dental pain is managed either by extraction or by chemo mechanical procedure to devitalized the symptomatic tooth until pandemic is resolved and further treatment can be accomplished. Another important point is avoidance of prolong contact with saliva or promote...
cough during intraoral film placement and extra oral radiograph is recommended instead. For a droplet-transmissible infection, wearing the surgical mask properly protects more than an ill-fitted, inappropriately used N95 mask. Evidence from a randomized control trial suggested that surgical masks and N95 masks had the same effectiveness in the prevention of pneumonia. United States Centers for Disease Control and Prevention in 2010 recommended the use of droplet precautions for confirmed or suspected influenza (H1N1) cases and the use of N95 masks for aerosol generating procedures [15]. In triage section, dental professionals should identify patient with fever, respiratory symptom, diarrhea, and history of travel to country with Covid-19 outbreak during the last 14 days in accordance with many published papers concerning this pandemic [16]. Suspected or confirmed Covid-19 patient should be treated for emergency conditions only in good naturally ventilated room (60 L/s), the room should be isolated from other patients to prevent person to person infection and there will be a special team for these cases with special equipment.

**Limitations**

The data are dynamic and daily changeable, so the result is precise at the time of writing of this paper. There is difficulty in obtaining some data in period of pandemic.

**Conclusion**

Possibly there was association between dental practice and Covid-19 infection but with it is no significant risk. The application of WHO guidelines increases safety in dental practice during Covid-19 pandemic in IRAQ.

**References**