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Research Article

KNOWLEDGE, ATTITUDE, AND PRACTICE OF DENTISTS REGARDING HBV PREVENTION IN RIYADH, SAUDI ARABIA

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Abstract:

Background: The hepatitis B virus (HBV) is a serious problem for medical professionals worldwide. Dental physicians are at the highest risk of HBV infection due to their frequent contact with blood and bodily fluids. **Methodology:** This was a cross-sectional study conducted among dental physicians in Riyadh, Saudi Arabia, to assess the dentists' knowledge, attitude, and practice regarding HBV prevention. **Results:** A total of 107 dentists were included in this study; 67.3% of them aged from 26-35 years, 73.8% had bachelor's degree, and 39.3% had clinical experience years from 2-4. A significant association was found between knowing the immediate symptoms that appear after HBV infection ($P=0.000$), the presence of PEP for HBV ($P=0.000$), and knowing about MTCT ($P=0.009$) and the participants' age. **Conclusion:** This study reported good knowledge levels, positive attitudes, and good practice towards HBV prevention among dental physicians in Riyadh, Saudi Arabia. We found relatively low knowledge levels was demonstrated regarding the presence of PEP for HBV, negative attitudes towards the effectiveness period of PEP, and poor practice of wearing gloves.

Keywords: HBV, dentists, knowledge, attitude, and practice.

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INTRODUCTION:

Hepatitis B virus (HBV) is a leading cause of acute and chronic liver infection throughout the world. HBV is acutely infecting nearly two billion people worldwide, with another 350 million chronically affected [1]. HBV-related chronic liver disease, such as cirrhosis, primary hepatocellular carcinoma, and liver cancer, kills at least one million people per year. Additionally, 75% of these cases come from Asia, where an estimated 8% to 15% of people are suspected of being active carriers of the deadly virus. Nearly 80% of infections are subclinical, which means they were undiagnosed for a long time. HBV is possibly 50–100 times more infectious than HIV in its latent form [1, 3].

HBV is most commonly transmitted from mother to child at birth (perinatal transmission) or via a horizontal transmission (exposure to infected blood) in highly endemic areas, particularly during the first five years of life from an infected child to an uninfected child. Needlestick injuries, piercing, tattooing, and exposure to contaminated blood and body fluids, such as saliva and seminal, menstrual, and vaginal fluids, can all transmit HBV. HBV may also be transmitted sexually. Infection in adulthood causes chronic hepatitis in less than 5% of cases, while infection in infancy and early childhood causes chronic hepatitis in almost 95% of cases [4].

The virus can also be transmitted by reusing needles and syringes, which can happen in healthcare facilities or among people who inject drugs. In addition, the infection may occur during medical, surgical, and dental practices through the use of razors and similar items that are contaminated with infected blood [4, 5]. Dentists, dental students, and their paramedics are at the greatest risk of contracting HBV, owing to the widespread and intensive use of small, sharp instruments that can quickly become contaminated with infectious blood during an invasive operation, which is the most common mode of HBV transmission. According to previous reports, general dentists face a 3–4 times greater risk of infection, and non-immunized surgical professionals face a six times greater risk of infection than the general public [6].

This occupational risk can be significantly reduced by widespread HBV vaccination and the use of recommended protective equipment, such as gloves, to prevent blood-borne infection transmission during dental procedures [7]. Since 1982, the HBV vaccine has been widely available and recommended for healthcare personnel whose work often exposes them to infected blood products [8].

The Centers for Disease Control and Prevention (CDC) in the United States of America revised their infection control recommendations for dental settings in 2003 [9]. A face mask, eye protection, protective clothes, and other cautionary materials that can be washed in an in-house laundry are all required for the preventive measures. To prevent occupational and infectious infections in healthcare workers, particularly dental healthcare workers, awareness and compliance with these recommendations are critical [10].

A cross-sectional study reported that the attitudes and behavior of dental students regarding the infection control rules were concerned throughout the 10-year assessment period. There was no evolution for most factors, such as the use of individual protection equipment (IPE), disinfection of the dental chair, and vaccination against HBV. Furthermore, the students' performance deteriorated over the course of ten years in certain procedures, such as burs sterilization and the use of protective eyewear [11].

Given the risen concerns about infection transmission among dental professionals, this study aims to assess the knowledge, attitude, and practice regarding HBV prevention among dentists in Riyadh, Saudi Arabia.

METHODOLOGY:

This was a cross-sectional study on dental physicians working in Riyadh, Saudi Arabia. The study was conducted from March to May 2021. Data was collected using an adapted online questionnaire from *Saeed et al.* [12], it was distributed to social media platforms, message texts, and emails.

The questionnaire comprised four parts; the first part presented the participants' sociodemographic characteristics such as age, gender, and clinical experience. The second part investigated the dentists' knowledge regarding HBV vaccination through 7 questions. The third part discussed their attitudes through 4 questions, and the fourth part indicated their practice through 3 questions. The questionnaire included written consent of volunteering for participating in this study.

The data were coded, processed, and analyzed using the Statistical Package for the Social Science (SPSS Inc., Chicago, IL) version 23 after the questionnaires were checked for completeness and accuracy. The qualitative variables were assigned percentages. The relation was determined using the Chi-square test, with a p-value of 0.05 deemed significant.

RESULTS:

Table (1) shows the sociodemographic characteristics of 107 dentists. Most of them (67.3%) aged from 26-35 years, 22.4% aged ≥ 36 years, and 10.3% aged from 21-25 years. The majority of the participants (73.8%) have a bachelor's (BDS) degree, 22.4% have a master's degree, and only 3.7% have Ph.D. Nearly (39.3%) of the dentists had 2-4 years of clinical experience, 31.8% had 5-9 years of experience, 22.4% had ≥ 10 years, and only 6.5% had less than 2 years.

Table (2) shows the participants' knowledge regarding HBV prevention. All of them (100%) were about HBV, that the liver is the main organ affected with HBV, the number of hepatitis virus types, and that the virus could be transmitted through contaminated blood. 83.2% knew about the HBV symptoms that appear instantly after infection, 52.3% knew about the Post-Exposure Prophylaxis (PEP) for HBV, 83.2% knew the HBV vaccine doses, and 92.5% knew about the Mother-to-child-transmission (MTCT).

Table (3) shows the participants' attitudes towards HBV prevention. The vast majority (95.3%) believe that they must take precautions during dealing with every patient, 68.2% believe that receiving the vaccine is an effective preventive measure against HBV, and only 21.5% think that PEP is greatly effective within 24 hours.

Table (4) shows the participants' practice regarding HBV prevention. Most dentists (97.2%) got vaccinated against HBV, more than half of them (53.3%) sterilize the used instruments, and only 29.9% wear gloves.

Table (5) presents the participants' knowledge about HBV prevention in association with their age. A significant association was found between knowing the immediate symptoms that appear after HBV infection ($P=0.000$), the presence of PEP for HBV ($P=0.000$), and knowing about MTCT ($P=0.009$) and the participants' age. The dentists ageing from 26-35 were more knowledgeable about HBV infection immediate symptoms (70.8%), PEP for HBV (83.9%), and MTCT (70.7%). However, we did not find a significant association between knowing that HBV could be transmitted through contaminated blood ($P=0.633$) and knowing the HBV vaccine doses ($P=0.120$).

Table (6) presents the participants' knowledge about HBV prevention in association with their qualifications. Knowing about PEP for HBV and

MTCT was significantly associated with the participants' qualifications ($P=0.002$) and ($P=0.018$), respectively. Participants with master's degree were more knowledgeable about the presence of PEP (87.5%) and MTCT (76.8%). However, no significant associations were reported between knowing the immediate symptoms that appear after HBV infection ($P=0.258$), HBV could be transmitted through contaminated blood ($P=0.071$), and knowing the HBV vaccine doses ($P=0.625$).

Table (7) presents the participants' knowledge about HBV prevention in association with the years of experience. We demonstrated a significant association between knowing the immediate symptoms that appear after HBV infection ($P=0.000$), the presence of PEP for HBV ($P=0.000$), and MTCT ($P=0.023$) and the participants' years of experience. The participants with 2-4 years of clinical experience had a greater level of knowledge regarding the immediate symptoms that appear after HBV infection (39.3%) and MTCT (37.1%), while those with 5-9 years of experience were more knowledgeable about the presence of PEP for HBV (39.4%). No significant association was found between HBV could be transmitted through contaminated blood ($P=0.107$) and knowing the HBV vaccine doses ($P=0.056$) and the years of experience.

Table (8) indicates the participants' attitudes towards HBV prevention in association with their age. We found a significant association between applying precautions during dealing with every patient ($P=0.001$) and believing that getting the vaccination is an effective preventive measure ($P=0.008$) and the participants' age. Participants ageing (26-35) years had the best attitudes towards applying precautions that must be considered during dealing with every patient (68.6%) and the effectiveness of HBV vaccination as a preventive measure (71.2%). However, believing that PEP is greatly effective within 24 hours was not significantly associated with the age ($P=0.459$).

Table (9) indicates the participants' attitudes towards HBV prevention in association with their qualifications. Believing that PEP is greatly effective within a period of 24 hours and getting the vaccination is an effective preventive measure were significantly associated with the participants' qualifications ($P=0.032$) and ($P=0.012$), respectively. Participants with bachelor's degree had more positive attitudes regarding the effectiveness period of PEP (87%) and the effectiveness of HBV vaccination as a preventive measure (76.7%). While applying precautions must be considered during dealing with

every patient was not significantly associated with the qualifications ($P=0.590$).

Table (10) indicates the participants' attitudes towards HBV prevention in association with the years of experience. There was a significant association between believing that getting the vaccination is an effective preventive measure ($P=0.029$), as the participants with 5-9 years of experience recorded the most positive attitudes (38.4%). However, we did not find a significant association between believing applying precautions must be considered during dealing with every patient ($P=0.531$) and PEP is greatly effective within a period of 24 hours ($P=0.058$).

Table (11) investigates the association between the participants' practice towards HBV prevention and their age. Instrument sterilization and getting vaccinated against HBV were significantly associated with the participants' age ($P=0.003$) and ($P=0.000$), respectively. The participants ageing from 26-35 years were keener on sterilizing instruments (57.9%) and got vaccinated against HBV (69.2%). Wearing gloves was not significantly associated with the participants' age ($P=0.292$).

Table (12) investigates the association between the participants' practice towards HBV prevention and their qualifications. Wearing gloves ($P=0.000$) and instrument sterilization ($P=0.000$) were significantly associated with the participants' qualifications. Participants with master's degree were more interested in wearing gloves (53.1%), and those with bachelor's degree were more interested in sterilizing instruments (50.9%). Getting vaccinated was not significantly associated with the participants' qualifications ($P=0.579$).

Table (13) investigates the association between the participants' practice towards HBV prevention and the years of experience. Wearing gloves ($P=0.029$) and instrument sterilization ($P=0.002$) were significantly associated with the participants' years of experience. Participants with clinical years of experience from 2-4 years were more interested in wearing gloves (46.9%) and sterilizing instruments (35.1%). Getting vaccinated was not significantly associated with the participants' qualifications ($P=0.189$).

Table (1) Participating dentists' characteristics, KSA, 2021 (N=107).

Parameter	Frequency	Percent
Age, y		
• 21 -	11	10.3%
• 26 -	72	67.3%
• ≥ 36	24	22.4%
Educational level		
• Bachelor (BDS)	79	73.8%
• Master	24	22.4%
• PhD	4	3.7%
Years of experience		
• < 2	7	6.5%
• 2 -	42	39.3%
• 5-	34	31.8%
• ≥ 10	24	22.4%

Table (2): Knowledge items (n=107).

Parameter	Correct answer, n (%)	Incorrect answer, n (%)
Knowledge regarding HBV	107 (100%)	0 (0%)
HBV symptoms appear instantly after infection	89 (83.2%)	18 (16.8%)
The liver is the main organ affected by HBV	107 (100%)	0 (0%)
The number of hepatitis virus types	107 (100%)	0 (0%)
There is Post-Exposure Prophylaxis (PEP) for HBV	56 (52.3%)	51 (47.7%)
HBV can be transmitted through contaminated blood	100 (93.5%)	7 (6.5%)
Mother-to-child-transmission (MTCT)	99 (92.5%)	8 (7.5%)
Aware about HBV vaccine doses	89 (83.2%)	18 (16.8%)

Table (3): Attitude items (n=107).

Parameter	Correct answer, n (%)	Incorrect answer, n (%)
Precautions must be considered during dealing with every patient	102 (95.3%)	5 (4.7%)
PEP is greatly effective within a period of 24 hours	23 (21.5%)	84 (78.5%)
Getting vaccinated against HBV is a measure of prevention	73 (68.2%)	34 (31.8%)

Table (4): Practice items (n=107).

Parameter	Correct answer, n (%)	Incorrect answer, n (%)	
Practice to prevent HBV	Wearing gloves	32 (29.9%)	75 (70.1%)
	instruments sterilization	57 (53.3%)	50 (46.7%)
	Got vaccinated against HBV	104 (97.2%)	3 (2.8%)

Table (5): The participants' knowledge about HBV prevention in association with their age.

Knowledge item	Age			P-value
	21 -	26 -	≥ 36	
Knowledge regarding HBV	11 (10.3%)	72 (67.3%)	24 (22.4%)	-
HBV symptoms appear instantly after infection	2 (2.2%)	63 (70.8%)	24 (27%)	0.000
The liver is the main organ affected with HBV	11 (10.3%)	72 (67.3%)	24 (22.4%)	-
The number of hepatitis virus types	11 (10.3%)	72 (67.3%)	24 (22.4%)	-
There is Post-Exposure Prophylaxis (PEP) for HBV	4 (7.1%)	47 (83.9%)	5 (8.9%)	0.000
HBV can be transmitted through contaminated blood	11 (11%)	67 (67%)	22 (22%)	0.633
Mother-to-child-transmission (MTCT)	8 (8.1%)	70 (70.7%)	21 (21.2%)	0.009
Aware about HBV vaccine doses	7 (7.9%)	63 (70.8%)	19 (21.3%)	0.120

Table (6): The participants' knowledge about HBV prevention in association with their qualifications.

Knowledge item	Qualification			P-value
	Bachelor	Master	PhD	
Knowledge regarding HBV	79 (73.8%)	24 (22.4%)	4 (3.7%)	-
HBV symptoms appear instantly after infection	63 (70.8%)	22 (24.7%)	4 (4.5%)	0.258
The liver is the main organ affected by HBV	79 (73.8%)	24 (22.4%)	4 (3.7%)	-
The number of hepatitis virus types	79 (73.8%)	24 (22.4%)	4 (3.7%)	-
There is Post-Exposure Prophylaxis (PEP) for HBV	49 (87.5%)	7 (12.5%)	0 (0%)	0.002
HBV can be transmitted through contaminated blood	76 (76%)	20 (20%)	4 (4%)	0.071
Mother-to-child-transmission (MTCT)	76 (76.8%)	19 (19.2%)	4 (4%)	0.018
Aware about HBV vaccine doses	65 (73%)	20 (22.5%)	4 (4.5%)	0.652

Table (7): The participants' knowledge about HBV prevention in association with the years of experience.

Knowledge item	Years of experience				P-value
	< 2	2 -	5 -	≥ 10	
Knowledge regarding HBV	7 (6.5%)	42 (39.3%)	34 (31.8%)	24 (22.4%)	-
HBV symptoms appear instantly after infection	2 (2.2%)	34 (38.2%)	30 (33.7%)	23 (25.8%)	0.000
The liver is the main organ affected with HBV	7 (6.5%)	42 (39.3%)	34 (31.8%)	24 (22.4%)	-
The number of hepatitis virus types	7 (6.5%)	42 (39.3%)	34 (31.8%)	24 (22.4%)	-
There is Post-Exposure Prophylaxis (PEP) for HBV	4 (7.1%)	24 (42.9%)	27 (48.2%)	1 (1.8%)	0.000
HBV can be transmitted through contaminated blood	7 (7%)	40 (40%)	29 (29%)	24 (24%)	0.107
Mother-to-child-transmission (MTCT)	7 (7.1%)	39 (39.4%)	34 (34.3%)	19 (19.2%)	0.023
Aware about HBV vaccine doses	7 (7.9%)	33 (37.1%)	32 (36%)	17 (19.1%)	0.056

Table (8): The participants' attitude towards HBV prevention in association with their age.

Attitude item	Age			P-value
	21 -	26 -	≥ 36	
Precautions must be considered during dealing with every patients	8 (7.8%)	70 (68.6%)	24 (23.5%)	0.001
PEP is greatly effective within a period of 24 hours	3 (13%)	13 (56.5%)	7 (30.4%)	0.459
Getting vaccinated against HBV is a measure of prevention	3 (4.1%)	52 (71.2%)	18 (24.7%)	0.008

Table (9): The participants' attitude towards HBV prevention in association with their qualifications.

Attitude item	Qualification			P-value
	Bachelor	Master	PhD	
Precautions must be considered during dealing with every patients	76 (74.5%)	22 (21.6%)	4 (3.9%)	0.590
PEP is greatly effective within a period of 24 hours	20 (87%)	1 (4.3%)	2 (8.7%)	0.032
Getting vaccinated against HBV is a measure of prevention	56 (76.7%)	17 (23.3%)	0 (0%)	0.012

Table (10): The participants' attitude towards HBV prevention in association with the years of experience.

Attitude item	Years of experience				P-value
	< 2	2 -	5 -	≥ 10	
Precautions must be considered during dealing with every patients	7 (6.9%)	39 (38.2%)	32 (31.4%)	24 (23.5%)	0.531
PEP is greatly effective within a period of 24 hours	4 (17.4%)	7 (30.4%)	9 (39.1%)	3 (13%)	0.058
Getting vaccinated against HBV is a measure of prevention	2 (2.7%)	26 (35.6%)	28 (38.4%)	17 (23.3%)	0.029

Table (11): The participants' practice regarding HBV prevention in association with their age.

Practice item	Age			P-value
	21 -	26 -	≥ 36	
Wearing gloves	2 (6.3%)	20 (62.5%)	10 (31.3%)	0.292
Instrument sterilization	4 (7%)	33 (57.9%)	20 (35.1%)	0.003
Got vaccinated against HBV	8 (7.7%)	72 (69.2%)	24 (23.1%)	0.000

Table (12): The participants' practice regarding HBV prevention in association with their qualifications.

Practice item	Qualification			P-value
	Bachelor	Master	PhD	
Wearing gloves	15 (46.9%)	17 (53.1%)	0 (0%)	0.000
Instrument sterilization	29 (50.9%)	24 (42.1%)	4 (7%)	0.000
Got vaccinated against HBV	76 (73.1%)	24 (23.1%)	4 (3.8%)	0.579

Table (13): The participants' practice regarding HBV prevention in association with the years of experience.

Practice item	Years of experience				P-value
	< 2	2 -	5 -	≥ 10	
Wearing gloves	0 (0%)	15 (46.9%)	6 (18.8%)	11 (34.4%)	0.029
Instrument sterilization	5 (8.8%)	20 (35.1%)	12 (21.1%)	20 (35.1%)	0.002
Got vaccinated against HBV	7 (6.7%)	39 (37.5%)	34 (32.7%)	24 (23.1%)	0.189

DISCUSSION:

It has been identified that HBV infection is a worldwide challenge among healthcare workers and that vaccination is a critical step in preventing the disease's transmission. Because of their interaction with blood and body fluids, medical staff, especially dentists, are at a higher risk of contracting HBV [6]. While it is generally assumed that a high level of

health literacy is correlated with improved health behaviour, health practitioners have not always shown health behaviour commensurate with their health literacy level [13]. This study was conducted to evaluate the dentists' knowledge, attitude, and practice towards HBV in Riyadh, Saudi Arabia.

This study demonstrated high levels of knowledge regarding HBV prevention among Saudi dentists; however, relatively lower knowledge levels were found about the presence of PEP for HBV. **Saeed et al. [12]** also reported that the knowledge about HBV prevention among the Saudi dentists and dental auxiliaries in Jeddah is considerably good; they also reported relatively poor knowledge regarding PEP. In contrast, a cross-sectional study aimed to assess the knowledge, attitude and practice about HBV occupational risk and reported a lack of knowledge about infectious HBV [13]. **Saqib et al. [14]** also reported that the knowledge level among Saudi dental students and interns about HBV was below average. Another cross-sectional study reported a fairly unsatisfied knowledge level among dental students [15]. The reported low levels of knowledge could be due to a lack of formal HBV training programs. Low levels of knowledge were also reported in India [16] and reported acceptable knowledge level in Iran [17]. **Jain et al. [18]** surveyed Mumbai dental interns, the majority of them are aware of HBV transmission and vaccination, but only a few are aware of the possibility of post-exposure vaccination.

The current study recorded positive attitudes towards HBV prevention among dentists; however, the poor attitude was found towards the effectiveness period of PEP. **Saqib et al. [14]** also reported highly positive attitudes among Saudi dental students. **Al-Hazmi et al. [13]** reported that 56.1% of Saudi dentists were willing to care for HBsAg-positive individuals, and 70.7% felt confident in treating patients with HBV. These positive attitudes could be attributed to the fact that infection management committees have strict regulations on infection control assessment. In China, **Li et al. [19]** reported that dental interns were not willing to deal with HBV patients and had poor attitudes towards HBV infection control.

Our findings found acceptable practices among dentists regarding HBV; however, most of the included participants did not wear gloves while treating patients. **Saeed et al. [12]** also reported a similar poor practice among the dental personnel regarding wearing gloves (33.6%). Whereas other Saudi studies conducted on dentists and dental students reported a high level of practice with (97.9%) [15] and (90.2%) [13].

In this study, being aware of immediate symptoms that appear after HBV infection was significantly associated with the participants' age ($P=0.000$) and years of experience. The presence of PEP for HBV was significantly associated with the participants' age

($P=0.000$), qualifications ($P=0.002$), and years of experience ($P=0.000$). Knowing about MTCT was significantly associated with the participants' age ($P=0.009$), qualifications ($P=0.018$), and years of experience ($P=0.023$). We also found a significant association between PEP's presence for HBV ($P=0.000$) and the years of experience. The participants ageing from 26-35 years, with master's degree, and those with 2-4 years of clinical experience were the most knowledgeable. **Saeed et al. [12]** confirmed a significant association between having information about the perinatal transmission of HBV ($p \leq 0.0001$) and educational level, and dentists with a Ph.D. degree were the most informed participants. **Brailo et al. [20]** found that as students progressed through their dental studies, their experience grew, which is partially applicable to this study. He also claimed that their experience did not match their attitude toward HBV patients when it came to treating and coping with them.

We found that applying precautions that must be considered during dealing with every patient was significantly associated with the participants' age ($P=0.001$). Believing that getting the vaccination is an effective preventive measure was also significantly associated with the participants' age ($P=0.008$), qualifications ($P=0.012$), and years of experience ($P=0.029$). The participants of this study ageing 26-35 years, with bachelor's degree, and those with 5-9 years of experience, had the most positive attitudes towards HBV prevention. Another study reported that when it comes to student attitudes, higher levels of education show a positive attitude when compared to lower levels; the difference was substantial ($P\text{-value} < 0.001$) [14]. This may be clarified because they have had less exposure to clinical work than those at higher levels. **Al-Shamiri et al. [15]** also reported that significantly more positive attitudes were noticed among the final year students than the interns.

In this study, wearing gloves was significantly associated with the participants' qualifications ($P=0.000$) and years of experience ($P=0.029$). The participants' age, qualifications, and years of experience were in significant association with instrument sterilization ($P=0.003$), ($P=0.000$), and ($P=0.002$), respectively. Moreover, getting vaccinated against HBV was in significant association with the patients' age ($P=0.000$). Participants aging 26-35 years, those with master's and bachelor's degree, and those with 2-4 years of experience recorded the greatest levels of practice. Using the personal protective equipment was adequate in other previous studies [21, 22]. The

recorded use of defensive barriers was higher than in a previous study in Yemen (face masks 53.8%, and eyewear 14%) [23].

The study limitations include the possible reporting bias with the self-administrated online questionnaire. Additionally, the small study samples and the fact that the questionnaire sections were not comprehensive may bias our results.

CONCLUSION:

This study reported good knowledge levels, positive attitudes, and good practice towards HBV prevention among dental physicians in Riyadh, Saudi Arabia. We found relatively low knowledge levels was demonstrated regarding the presence of PEP for HBV, negative attitudes towards the effectiveness period of PEP, and poor practice of wearing gloves. Participants ageing from 26-35 years, dentists with master's degrees and those with 2-4 years of clinical experience, recorded the highest levels of knowledge, attitude, and practice about HBV prevention.

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