Original Research Article

Community Awareness about Diphtheria Prevention and Control in Hodeidah, Yemen 2018

ABSTRACT

Background: Unfortunately; diphtheria occurres in Yemen as a fatal epidemic since the end of 2017. Al-Hodeida governorate (at Western Yemen) is represented as the second governorate in Yemen for the burden of diphtheria epidemic. Different NGOs and ministry of health conducted control measures to combat the epidemic including health education but the awareness of the local inhabitants was not assessed before.
Aim: To assess the community awareness towards diphtheria prevention and control.
Study Design: Cross sectional study
Place and Duration of the Study: Three districts in Hodeidah governorate in Yemen (Al-Hali, Al-Hawak and Biat Al-Faqih districts). The study is conducted during January 2018.
Methodology: A sample size of 336 adults over 18 years of age living in the targeted districts were recruited in the study. The data was collected through patient's home visits.
Results: The mean awareness score of diphtheria is 2.8, this is a poor indicator, because it is less than the expected mean score of 3.5. The mean awareness score in males is 10.9, while in females is 10.3, but the difference is not significant. Only 41% of persons interviewed are aware about the disease (35.3% in Al-Hawak and 31.9% in Al-Hali districts), better awareness were observed in Biat Al-Faqih district (70.7%). Knowledge about the availability of vaccine against diphtheria is of the highest proportion (47.6%) while poorest knowledge is regarding the transmission of the disease (37.5%).
Conclusion: The local community is not aware about diphtheria as a fatal disease.

Key words: Diphtheria, Awareness, Yemen

1. INTRODUCTION

Diphtheria was one of the leading causes of childhood death in the pre-vaccine era [1]. However, after the diphtheria toxoid vaccine was invented in 1923, and subsequently was used on a large scale in many countries, incidence quickly declined. And specifically was a continued decline after the launch of the Expanded Programme on Immunization (EPI) in 1977 [2]. As a result, physicians in many nations have never seen a case of diphtheria and may be unaware that there are approximately 5000 cases of diphtheria reported worldwide each year [3].

Unfortunately; diphtheria occurred in Yemen as a fatal epidemic since the end of 2017. WHO reported up on 26th February 2018 a total of 1193 probable cases with 72 diphtheria associated deaths that are 7 % of Case Fatality Rate (CFR). Twenty governorates are affected with Diphtheria outbreak and 171 Districts are affected, most effected governorates are Ibb and Al-Hdiedah [4].

Al-Hodeida governorate (at Western Yemen) is represented as the second governorate in Yemen for the burden of diphtheria epidemic. A total 141 cases were reported with 12 deaths (CFR 8.5%). Al-Hali, Biat AL Faqih and Al Hawak districts are the most effected districts in Hodeidah, Yemen [4]. Up to our knowledge; there are no studies addressed awareness of the local inhabitants about this diseases and its prevention in Yemen, so the aim of this study is to assess the community awareness towards diphtheria prevention and control in the affected three districts in Al-Hodeida governorate in Yemen.

2. METHODS

A cross sectional study was conducted in three affected districts by the current diphtheria outbreak in Hodeidah governorate in Yemen (Al-Hali, Al-Hawak and Biat AL-Faqih). A sample size of 336 adults over 18 years of age living in the targeted districts were recruited in the study. The data was collected through patient's home visits. Data of diphtheria patient from the diphtheria isolation and treatment center in AL Thawara tertiary hospital in Hodeidah city was used to determine the first house to be enrolled in the study then 6 consecutive houses in the patient residence were also enrolled. One person over 18 years of age from each house was asked to participate in the study. As a total, patients admitted to the diphtheria isolation and treatment center from the targeted districts were 48 patients before the study implemented, and the study targeted 7 houses from every patient residence including the patient house as the first house, so the total sample was 336 persons.

Fig. 1. Map of Yemen, the red area is Hodeidah governorate

After obtaining a consent from the participants, a well trained persons collected data by using a structured questionnaire. The questionnaire used to collect data about the socio-demographic data, knowledge, attitude and practice of mothers towards diphtheria prevention and control. The Data were collected during January 2018 and analyzed using Statistical Package Social Sciences (SPSS) version 23.

3. RESULTS

A total of 336 persons were interviewed (155 from al-Hawak, 111 from Al-Hali and 70 persons from Biat AL Faqih districts).The mean age of the participants was 33.8 ±12 years with arrange between 18 to 104 years. Females constitute 60.7% of the total participants, they were 204 females, while males were only 132 persons (39.3%). Young adults (less than 30 years of age were 135 persons (40.2%).The mean awareness score about diphtheria is 2.8 which is a poor indicator because it is less than the expected mean score of 3.5.

The mean awareness score in males is 10.9, while for females is 10.3, but the difference is not significant (p-value >0.05). The mean awareness score of youth group was11.5 while for adults of more than 30 years of age was 11 without significance difference (p-value>0.05).

The local community was not aware about diphtheria as a fatal disease, only 41% of persons interviewed were aware about the disease (35.3% in Al-Hawak and 31.9% in Al-Hali districts), better awareness were observed in Biat AL Faqih district (70.7%). Knowledge about the availability of vaccine against diphtheria was of the highest proportion (47.6%), while the poorest knowledge was regarding the transmission of the disease (37.5%). (Table 1 & Fig. 2).

There is a gender difference in knowledge on three items: about 48% of males know that diphtheria can be treated while 36.7% of females know this fact (*p*-value 0.02), and 49% of females said that they know how diphtheria agent is transmitted, compared with 30% of females (*p*-value <0.01), but when they were asked to mention "what is exactly the mode of transmission?"; 38% of females gave the correct answer, "through air", while only 28% of males gave the correct answer (*p*-value 0.04). (Table 2).

Regarding the age group, we classified the participants into two groups: 18 < 30 years (youth group) and over 30 years (adult group). The results shows that the only significant difference, exists in their knowledge about availability of vaccine against diphtheria in health facilities. Adult group (52%) was more aware than youth group (40.7%) regarding the availability of vaccine (*p* - value 0.02), (Table 3).

Table 1. Community awareness towards diphtheria prevention and control

Indicators	Al Hali District n=118	Al-Hawak District n=148	Biat AL Faqih District n=70	Total N=336
Person know about diphtheria	28 (23.7%)	58 (39%)	41 (58.6%)	127 (37.8%)
Person know that Diphtheria can be prevented	36 (30.5%)	49 (33%)	49 (70%)	134 (39.9%)
Person know that Diphtheria can be treated	37 (31.3%)	48 (32.4%)	54 (77%)	139 (41.4%)
Person know there is vaccine available for diphtheria	42 (35.5%)	65 (44%)	53 (75.5%)	160 (47.6%)
Person know how diphtheria transmitted	34 (28.8%)	45 (30.4%)	47 (67%)	126 (37.5%)
Person know that Diphtheria transmitted through air	44 (37.3%)	45 (30.4%)	46 (65.7%)	135 (40.2%)
Person know that vaccination is necessary to prevent diphtheria	43 (36.4%)	56 (37.8%)	57 (81.4%)	156 (46.4%)
Mean percentage of overall awareness about diphtheria	31.9%	35.3%	70.7%	41.5%

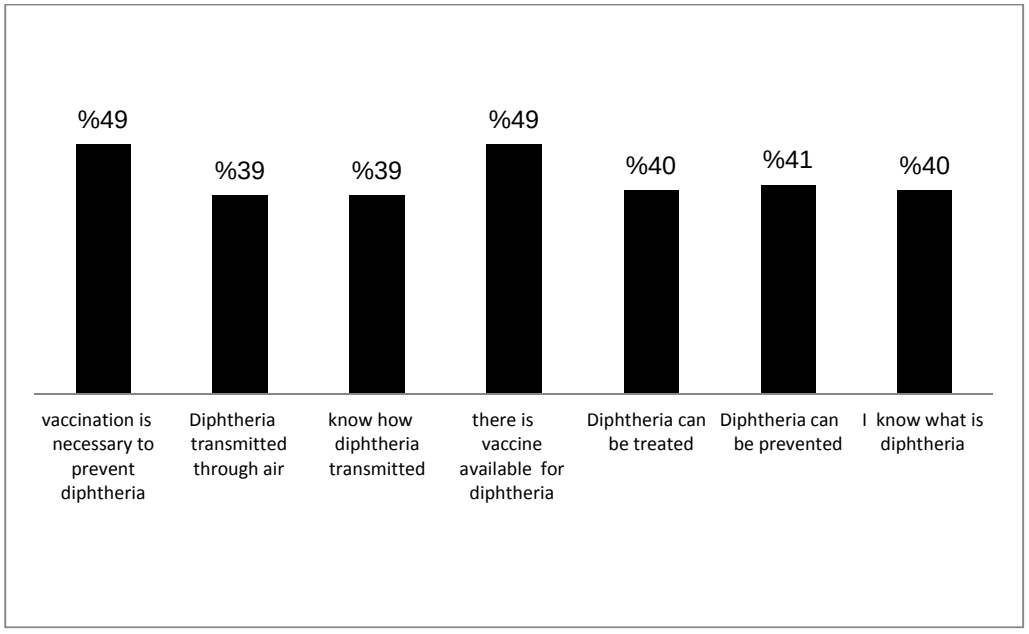

Fig. 2. Community awareness towards diphtheria prevention and control: response of persons interviewed at home in 3 districts in Hodeidah, Yemen

Table 2. Gender and community awareness about diphtheria prevention and control

Indicators	Male n= 132	Female n= 204	Total n=336	*p*-value
Person know about diphtheria	55 (41.6%)	72 (35.3%)	127 (37.8%)	0.14
Person know that Diphtheria can be prevented	56 (42.4%)	78 (38.2%)	134 (39.9%)	0.25
Person know that Diphtheria can be treated	64(48.5%)	75(36.7%)	139 (41.4%)	0.02*
Person know there is vaccine available for diphtheria	64 (48.5%)	96 (47%)	160 (47.6%)	0.44
Person know how diphtheria transmitted	65 (49.2%)	61 (30%)	126 (37.5%)	0.00*
Person know that Diphtheria transmitted through air	57 (28%)	78 (38.2%)	135 (40.2%)	0.04*
Person know that vaccination is necessary to prevent diphtheria	65 (49.2%)	91 (44.6%)	156 (46.4%)	0.23

**Significant at level of 0.05*

Table 3. Age group and community awareness about diphtheria prevention and control

Indicators	Age group		Total N=336	*p*-value
	<30 Years (Youth group) n=135	30 years + (Adult group) n=201		
Person know about diphtheria	44 (32.6%)	83 (41.3%)	127 (37.8%)	0.06
Person know that Diphtheria can be prevented	53 (39.3%)	81 (40.3%)	134 (39.9%)	0.47
Person know that Diphtheria can be treated	50 (36.8%)	89 (44.3%)	139 (41.4%)	0.11
Person know there is vaccine available for diphtheria	55 (40.7%)	105 (52.2%)	160 (47.6%)	0.02*
Person know how diphtheria transmitted	44 (32.6%)	82 (40.8%)	126 (37.5%)	0.07
Person know that Diphtheria transmitted through air	52 (38.5%)	83 (41.3%)	135 (40.2%)	0.50
Person know that vaccination is necessary to prevent diphtheria	59 (43.7%)	97 (48.3%)	156 (46.4%)	0.23

**Significant at level of 0.05*

4. DISCUSSION

This community based study is limited to the relatives and neighboring house's members of the reported diphtheria patients; the sample may not represent the all community, but it can be a purposive sample of local inhabitants who make daily contact with the patients. The study gives us valid data about awareness of people living the stress of the outbreak. We expected that they have high stress and motivation to know about the disease control and prevention, although of this social and psychological motivation, but the findings of this study show lack of knowledge about the disease process, prevention and control. Creating health awareness is an effective way to prevent the spread of diseases affecting the local community, and raising awareness of individuals and communities is one of the factors that influence the health [5].

Knowledge of the local inhabitants about prevention and treatment of diphtheria is good, as the expanded program of immunization provides a pentavalent vaccine for diphtheria prevention in Yemen for long time, WHO recommended that the most effective way of preventing diphtheria is to maintain a high level of immunization in the community [6,7].

Awareness about diphtheria prevention through vaccination is good and with no significant difference between males and females. The only significant difference in knowledge of males about available

treatment and transmission of diphtheria. Studying the gender difference in their knowledge about diphtheria is not well addressed in any studies; The general belief has been that since infectious diseases affect both males and females, it is best to focus on public health attention during an outbreak on control and treatment, and to leave it to others to address social problems that may exist in society, this view is understandable [8]. Moreover poor knowledge about many diseases in both males and females was reported elsewhere [9]. It was reported that immunization is the effective tool to prevent diphtheria as a disease and as an outbreak; and the recent diphtheria outbreak in Yemen (in late 2017) are due to poor routine vaccination coverage which explained by poor knowledge reported in this study [10]. Provide both parents correct information and enhance communication with them will increase vaccination coverage specifically health information provided by health workers and doctors is significantly associated with parental acceptance of recommended vaccinations [11, 12].

Studies about awareness of people regarding diphtheria are scarce. Only one study conducted in Russia and published in 2000 described this problem during diphtheria outbreak in 1993, this study concluded that most of adults interviewed saw diphtheria as a potentially serious disease but not as a very immediate personal threat and they felt no great urgency regarding the need to take preventive measures like vaccination [13]. Peng-junLu et al. (2017) reported that in USA, adult group have significance better knowledge regarding availability of vaccine against diphtheria in the health facilities than young group, [14]. Young parents and adolescent are unaware about vaccination recommendation in USA [15].

5. CONCLUSION

The local community in Hodeidah in Yemen is not aware about diphtheria as a fatal disease. To achieve universal coverage of prevention of diphtheria outbreak by vaccination; a well-organized and effective health education activities are needed before conducting any preventive measures to raise the community awareness.

Ethical Approval:

As per international standard or university standard written ethical approval has been collected and preserved by the author(s).

Consent Disclaimer:

As per international standard or university standard, patient's written consent has been collected and preserved by the author(s).

REFERENCES

1. Zakikhany K, Efstratiou A. Diphtheria in Europe: Current problems and new challenges. Future Microbiology. 2012;7(5):595-607.
2. Clarke KEN. Review of epidemiology of diphtheria 2000-2016. Center for Diseases Control and Prevention (CDC); 2017.
3. Diphtheria Reported Cases. World Health Organization (WHO) Region: 1980-2016; 2017.
4. Ministry of Public Health and Population (MPH&P)/World Health Organization (WHO).The daily diphtheria outbreak report. EDEWS (Yemen) 26 February 2018.
5. World Health Organization (WHO). Health villages: A guide for communities and community health workers; 2002.
6. World Health Organization (WHO), Immunization, vaccines and biological, diphtheria - The disease; 2018
7. Schempf AH, Minkovitz CS, Donna M, Strobino DM, Guyer B. Parental Satisfaction with early pediatric care and immunization of young children: The mediating role of age-appropriate well-child care utilization. Arch Pediatr Adolesc Med. 2007;161:50-65.
8. World Health Organization (WHO). Taking sex and gender into account in emerging infectious disease programmes: An analytical framework; 2011.

9. Kumar IU, Murthy JP, Upadya U, Venkatesh M. Gender differences in awareness of diabetes mellitus among the rural population. Asian Journal of Medical Sciences. 2017;l8(2): 44-49.
10. Lee HJ, Choi JH. Tetanus–diphtheria–acellular pertussis vaccination for adults: An update. Clinical and Experimental Vaccine Research. 2017;6(1):22-30.
11. Coniglio MA, Platania M, Privitera D, Giammanco G, Pignato S. Parents' attitudes and behaviors towards recommended vaccinations in Sicily, Italy. BMC Public Health. 2011;11(305) :1–6.
12. Falagas ME, Zarkadoulia E. Factors associated with suboptimal compliance to vaccinations in children in developed countries: A systematic review. Curr Med Res Opin. 2008;24(6):1719-41.
13. Porter RW. Role of Health Communications in Russia's Diphtheria Immunization Program. The Journal of Infectious Diseases. 2000;(181)1:S220–S227. Available:https://doi.org/10.1086/315566
14. Lu PJ, O'Halloran A, Kennedy ED, Williams WW, Kim D, Fiebelkorn AP, Donahue S, Bridges CB. Awareness among adults of vaccine-preventable diseases and recommended vaccinations, United States. Vaccine. 2015;2017:35(23):3104-3115.
15. Kennedy A, Stokley S, Curtis CR, Gust D. Limited awareness of vaccines recommended for adolescents and other results from two national consumer health surveys in the United States. Journal of Adolescent Health. 2012;50(2):198-200.