ORIGINAL RESEARCH

DOCTORS' KNOWLEDGE LEVEL AND ATTITUDES CONCERNING AVIAN INFLUENZA

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ABSTRACT

Objective: Avian influenza cases have been detected in Turkey and human deaths have been reported. The aim of this study was to investigate the knowledge, attitudes, and behaviour of doctors concerning avian influenza.

Method: A questionnaire was applied to a total of 172 doctors, 82 in the university, 46 in the state hospital and 44 in primary care clinics, in a district of Istanbul, in 2006.

Results: The participant doctors were general practitioners(GPs) (27%), specialists(31%), and residents(42%). The male/female ratio was 48/52% and the median age value was 32(23-53). The mean knowledge score was 14.4±4.4; 15.9% of the doctors had low, 77% medium, 7% high knowledge level. Transmission (94%), symptoms in humans (94%) and preventive measures (89%) were well-known. The agent of avian flu, timing of the treatment, antiviral agents were less well-known. The GPs were more knowledgeable and felt more competent than the specialists and residents to give counselling; 53% felt competent and 74% responsible to give counselling. Half of the participants revealed a decrease in their habit of eating egg and chicken.

Conclusion: Doctors need more information to enable early diagnosis and an early start to the therapy which would help to decrease fatality and to prevent the spread of the virus.

Keywords: Avian influenza, Knowledge level, Attitude

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DOKTORLARIN KUŞ GRİBİ HAKKINDA BİLGİ DÜZEYİ VE TUTUMLARI

ÖZET

Giriş: Kuş gribi olguları Türkiye'de saptanmış, insan ölümleri bildirilmiştir. Çalışmamızın amacı hekimlerin kuş gribi hakkındaki bilgi düzeyleri, tutum ve davranışlarını araştırmaktır.

Yöntem: İstanbul'un Üsküdar ilçesinde, 2006 yılında seksen ikisi üniversitede, 46'sı devlet hastanesinde ve 44'ü birinci basamakta çalışan toplam 172 hekime bir anket formu uygulandı.

Bulgular: Katılan hekimlerin %27'si pratisyen, %31'i uzman, %42'si asistan hekimdi. Erkek/Kadın dağılımı %48.3/51.7 şeklinde olup ortanca yaş değeri 32(23-53) 'di. Ortalama bilgi puanı 14.4±4.4 olup hekimlerin %15.9'u düşük, %77'si orta, %7'si yüksek bilgi düzeyine sahipti. Bulaş yolları (%94), insandaki belirtileri (%94), koruyucu önlemler (%89) iyi bilinmekteydi. Kuş gribinin etkeni, tedavinin zamanlaması, antiviral ilaçlar daha az biliniyordu. Pratisyen hekimlerin bilgi düzeyinin uzman ve asistanlara göre daha yüksek olduğu ve kendilerini danışmanlık vermede daha yeterli hissettikleri belirlendi; danışmanlık için %53'ü kendisini yeterli, %74'ü ise sorumlu hissediyordu. Hekimlerin yarısı yumurta ve tavuk yeme alışkanlıklarında azalma olduğunu belirtti.

Sonuç: Hekimler, hastalığın öldürücülüğünün ve virüsün yayılımının engellenmesi için gerekli olan erken tanı ve erken tedavi için daha fazla bilgiye ihtiyaç duymaktadır.

Anahtar Kelimeler: Kuş gribi, Bilgi, Tutum

INTRODUCTION

Avian influenza, or "bird flu", is a viral infectious disease that normally infects birds. In domestic poultry, the highly pathogenic form of the virus spreads rapidly through the poultry and causes a high mortality rate within two days[1]. The current poultry outbreaks of avian flu in South-East Asia in mid-2003, has drawn attention to the causative agent of the infection. The H5N1 type of influenza virus family was the most important one[2].

H5N1 is also of particular concern for human health as one of the few avian influenza viruses that have"crossed the species barrier"[1] to infect humans. The infection is transmitted by direct contact with infected poultry or with objects contaminated with the faeces of the poultry in which large quantities of the virus are present. During the outbreaks, H5N1 resulted in severe human disease with an aggressive clinical course and high fatality rate. In the outbreak of 2003, human infections were reported from South-East Asia[3,4]. The same type of virus has also been detected in Turkey and human deaths from avian flu were reported[5,6].

The greatest concern is that the virus could mutate into a highly infectious form that could easily be transmitted from human to human and could start a global outbreak. The risk of a pandemic avian influenza persists and is serious. Each additional human case gives the virus an opportunity to improve its transmissibility in humans and thus develop into a pandemic strain[1,7,8].

Limited human-to-human transmitted cases with avian influenza have occurred during the outbreaks. These cases revealed that transmission occurred in cases of very close contact with an ill person. For the human cases that occurred among close family members it was impossible to prove the presence of human-to-human transmission since the family members were exposed to the same animal and environmental conditions.

The World Health Organization recommended all countries adopt strategies "to strengthen national preparedness, to reduce opportunities for a pandemic virus to emerge, to improve the early warning system, to delay initial international spreading and accelerate vaccine development"[1,8]. Despite advance warning, the world is not adequately prepared for a pandemic.

Avian influenza continues to be on the daily agenda of our country which is on the migration pathway of the birds. Awareness in

the population about avian flu and preventive measures to be taken against the spreading of the disease are important. The Ministry of Health has sent a brief including comprehensive information about avian flu and material for patient education to all the state health centres to improve the knowledge level of the doctors who are responsible for patient education for the prevention of the disease and for intervention during a possible epidemic.[8,9].

The aim of our study is to investigate the knowledge level and attitudes of the doctors who work in primary, secondary and tertiary health care systems.

MATERIAL AND METHOD

Type of the study: This is a descriptive type, investigating knowledge and attitude.

Population: Doctors who work in primary, secondary and tertiary health institutions in the region of our faculty.

Localization of the study: The study has been conducted in all the primary health centres of the Üsküdar region in a University and a State Training and Research Hospital.

Timing of the study: This study was carried out in the first three months of 2006.

Sample size: The sample size was calculated with an estimated rate of %10 prevalence of awareness concerning avian flu, acceptable error 0.05 and alpha error 0.05 (95% confidence interval (CI)).It was planned to interview at least 138 physicians among the total number of 960 doctors. 82 in the University Hospital, 46 in the State Hospital, and 44 in primary care centres. A total of 172 doctors were interviewed. All the primary care centres in the region and all the departments in the hospitals were visited. The questionnaires were given to the doctors who accepted to participate in the study and were taken back after they were filled out.

Permission: The Ethic Committee consent was obtained from the Marmara University, Medical School Ethic Committee. Permission for the realization of the Project was obtained from the Provincial Health Directory.

Questionnaire: In these institutions, the doctors who accepted to participate in the study were asked to complete a questionnaire that included knowledge level and attitude questions. The questionnaires were handed out and then collected after they were filled out. The questions were developed according to the information gathered from current literature. There were nine questions related to attitudes, fourteen questions related to knowledge. For the assessment of the questionnaire, every knowledge question was given a score according to the difficulty level and the doctors' knowledge level was assessed. The knowledge level was assessed over 27 points: a score between 0-10 points was accepted as a low level of knowledge, between 11-20 points medium level, 21 points and over, high level of knowledge. Attitude questions were asked to determine the influence of the media and the cases encountered by doctors in our country.

Data analysis: Data analysis in the SPSS statistical program was applied for the differences between groups, and the qui-square test was used for the internal validity of the questionnaire correlation analysis.

RESULTS

Of the 172 doctors who participated in our study, 25.6% (n=44) were general practitioners, 29.7% (n=51) specialists and 39.5% (n=68) residents; 9 doctors did not mention their job (5.2%). The male/female distribution of the physicians was 48.3%/51.7%, mean age value was 33.7± 6.9SD (23-53).

The kowledge level of the participants about avian flu was summarized in Table I. The correlation analysis of the questionnaire's Cronbach alpha was 0.73. The knowledge level of 170 physicians was determined as two participants did not answer the related questions.

Table I. The knowledge level of the participants

Knowledge questions	Total score 27	Know %(n)	Do not know %(n)
Name and group of the etiologic agent (n=170)	2	31.2 (53)	23.5 (40)
Name or group of the etiologic agent		45.3 (77)	
In which animals (n=170)	1	81.8 (139)	18.2 (31)
What is the reservoir (n=170)	1	48.8 (83)	51.2(87)
Where do the animals carry the etiologic agent (n=170)	2	85.3 (145)	14.7 (25)
How does the agent infect humans (n=170)	4	94.1 (160)	5.9 (10)
What are the symptoms (n=170)	4	94.1 (160)	5.9 (10)
From which body sites can the agent be isolated (n=170)	2	65.7 (111)	34.3 (58)
How is its endurance to outer conditions (n=170)	4	71.8 (122)	28.2 (48)
What is the incubation time in humans (n=169)	1	39.1 (66)	60.9 (103)
Laboratory findings in humans (n=170)	1	11.2 (20)	88.8 (150)
What medication is used in therapy (n=170)	1	62.9 (107)	37.1 (63)
When is the therapy most effective (n=169)	1	67.5 (114)	32.5 (55)
Preventive measures (n=170)	3	89.4 (152)	10.6 (18)

The mean score of knowledge questions was 14.4 ± 4.4 (2-27 points). Only 15.9% (n=27) of the participant doctors were in the low knowledge level group, 77.1% (n=131) were in the medium level and 7.1% (n=12) in the high level group of knowledge. The comparative analysis according to tasks represented the data of 163 physicians; 9 out of 172 doctors did not mention their job.

General practitioners were more informed than specialists and residents ($p<0.001$). Nine among 12 physicians in high score group were general practitioners. In the low knowledge level group there were very few general practitioners. The disribution of knowledge level according to the type of doctor were presented on Table II. The subjects least known by the general practitioners were: laboratory findings in humans (11.4%, n=5), the reservoir for the virus (59.1%, n=26/44), isolation site of the infection (65.9%, n=29/44), medication (65.9%, n=29/44) and the incubation period in humans (61.4%, n=27/44).

The knowledge level was related to age; physicians in the age group 43-53 had a higher knowledge score than younger colleagues (Table III).

The participants' views, attitudes and behaviour were summarized in Table IV.

Male doctors thought that avian flu did not cause any threat (male 12.0%, n=10; female 3.4%, n=3) (p=0.042, *Fisher's); female doctors (85.4%, n=76) were more concerned than males (68.7%, n=57) about avian flu (p=0.009); in females the habit of eating chicken changed toward not eating it (male 57.8%, n=48/83; female 73.0%, n=65/89, p=0.036, Qui-square) but the same relationship was not detected between gender and the habit of eating egg. Male doctors (62.7%, n=52) felt more competent than females (43.2% n=38) to give counselling (p=0.039) but there was no statistically important relationship between gender and knowledge level.

Also there was no relationship between age groups and attitudes/behaviour; between the idea that "avian flu causes epidemics", "feeling responsible", "thinking that sufficient preventive measures had been taken" and the knowledge level.

General practitioners (65.9%, n=29/44) felt themselves more competent than specialist and residents (45.8%, n=54/118) to give counseling (p=0.023) and they thought (50.1, n=22/44) that sufficient preventive measures

had been taken in the country. This was different from the views of the specialists and resident doctors (29.4%, n=35/119). (p=0.014, Mann-Whitney U Test).

It was determined that in the high knowledge level group, no change occurred concerning eating chicken, but in the lower knowledge level groups, a decrease was detected toward not eating chicken (p=0.047) and egg (p= 0.038). There was no change among the resident doctors and GPs concerning eating eggs, but a decrease was determined in that of the specialists (p=0.022, Qui-square). Table V.

Table II: Relation between the doctors' knowledge level and the type of doctor

	Knowledge level (%)			
	Low	**Medium**	**High**	**Total**
	0-10	**11-20**	**21-27**	
Type of Doctor	**%(n)**	**%(n)**	**%(n)**	**%(n)**
Specialists	14.0 (7)	84.0 (42)	2.0 (1)	100.0 (50)
Residents	25.4 (17)	71.6 (48)	3.0 (2)	100.0 (67)
General Practitioners	4.5 (2)	75.0 (33)	20.5 (9)	100.0 (44)
Total	16.1 (26)	76.4 (123)	7.5 (12)	100.0 (161)

Table III. Distribution of knowledge level related to age groups.

	Knowledge level (%)					
Age groups	**Low +Medium 0-20 %(n)**		**High 21-27 %(n)**		**Total %(n)**	
23-32	96.4%	81	3.6%	3	100.0	84
33-42	93.3%	56	6.7%	4	100.0	60
43-53	76.2%	16	23.8%	5	100. 0	21
total	92.7%	153	7.3%	12	100.0	165

*Between 23-32 and 43-53 *p*=0.002, between 33-42 and 43-53 *p*=0.033, Mann-Whitney U Test

Table IV: The distribution of answers related to participants' views, attitudes and behaviour.

Views and attitudes	**Answers %(n)**		
Does avian flu cause a threat, according to you? (n=172)	No, it does not 7.6 (13)	Yes, it does 70.3 (121)	It can cause big danger 22.1(38)
Are you concerned? (n=172)	No, I am not 22.7 (39)	Yes, I am 73.8 (127)	I am very concerned 3.5 (6)
What is the possibility of causing an epidemic? (n=172)	Low 37.8 (65)	Medium 48.8 (84)	High 13.4(23)
Do you think that sufficient preventive measures have been taken in our country? (n=172)	No 57.0 (98)	I do not know 9.3 (16)	Yes 33.7(58)
Does anyone in your environment ever question you about this subject ? (n=172)	Never 12.2 (21)	Yes, sometimes 65.1 (112)	Yes,frequently 22.7 (39)
Attitude			
Do you feel competent to give counselling? (n=171)	No 14.0 (24)	Partly 33.3 (57)	Yes 52.6 (90)
Do you feel a responsibility to give counselling? (n=171)	No 5.8 (10)	Partly 19.9 (34)	Yes 74.3 (127)
Behaviour			
Decrease in the habit of eating chicken (n=172)	No 34.3 (59)	Yes 51.7 (89)	I do not eat it 14.0 (24)
Decrease in the habit of eating egg (n=168)	No 46.5 (80)	Yes 43.0 (70)	I do not eat it 10.5 (18)

Table V. Behaviour differences between knowledge level and types of doctor.

	Behaviour					
	No		Yes + I do not eat it		Total	
Groups	%	n	%	n	%	n
Knowledge level groups						
Low (0-10)	17.9	5	82.1	23	100.0	28
Higher (11-27)	37.3	53	62.7	89	100.0	142
Types of Doctor						
Residents	52.9	36	47.1	32	100.0	68
Specialists	31.4	16	68.6	35	100.0	51
General Practitioners	56.8	25	43.2	19	100.0	44

DISCUSSION

In primary care health centres, preventive care is of priority. Matters of public health concern are under the responsibility of doctors working in primary care. In secondary and tertiary health centres, diagnostic and therapeutic health care have priority. However, there are some public health problems that affect the entire world, and doctors in general should be aware of these. Avian flu is one of them. We recruited in our study the doctors from primary, secondary and tertiary health care to investigate the knowledge level and the attitudes of the doctors who work in primary, secondary and tertiary health care systems. The total of primary health care centres and all the clinics in the two hospitals were visited in order to interview the doctors. The workload of the

doctors especially in the hospitals prevented us from reaching a higher participant number as they did not volunteer to answer the questionnaire. This is considered as a limitation of our study.

The Cronbach'a alpha of the questionnaire was not high (0.73) but was acceptable; it could be ameliorated with some modifications to measure the knowledge level of the health personnel about avian flu or used as an objective tool for self-assessment.

The knowledge mean score of all the participants was fourteen. Seventy-seven-per-cent of all the participants had medium knowledge level about avian flu. Thew doctors mostly knew how it was transmitted (94.1%), the symptoms of the infection in humans (94.1%), preventive measures (89.4%), the body site where the animals carry the virus (85.3%) and the animals affected by the virus (81.8%). The agent of avian flu, its endurance to outer conditions, the timing of the treatment, body sites from where the etiologic agent could be isolated, medication used for the treatment were less well-known. The reservoir for the virus (48.8%), the incubation period for the humans (39.1%) and laboratory findings in humans (11.2%) were the least known characteristics of the infection. The reports of the human and animal cases in the country were well-covered by the daily media, and this could have played a role in spreading knowledge about the transmission methods and the symptoms of the infection, where as the etiologic agent, the medication and the start time for the treatment, which needs more scientific knowledge were not mentioned. It is known that the early initiation of appropriate therapy decreases the fatality of the infection in human cases[10,11]. More information about the virus and the infection in humans, about the timing and the medication should be provided to doctors especially those working in primary care. This would help early diagnoses of the infection and and early application of appropriate antiviral therapy to warrant greatest clinical benefit.

According to the scoring system, in the high level group, nearly all the doctors were general practitioners where as in the low knowledge level group there were only a few. General practitioners were more knowledgeable than specialists and residents and they felt themselves more competent to give counselling and thought that sufficient preventive measures had been taken about avian flu. After the avian flu cases emerged in our country, in-service training and educational material were provided by the Ministry of Health to inform health personnel[8]. These efforts were consistent with the World Health Organization's recommendations to develop strategies for supporting preventive measures to reduce opportunities for a pandemic and to improve the early warning system1. The higher knowledge of the GPs could be related to these efforts.

A statistically significant relationship has been detected between knowledge level and behaviour. In the groups with a score of 11 and higher, no change was detected in the habits of eating chicken and egg, but in the lower knowledge level groups, doctors changed their behaviour towards not eating chicken ($p=0.047$) and egg ($p= 0.038$). As a supportive result, there was no change in the habits of eating egg of the residents and GPs, but a decrease was determined in that of the specialists ($p=0.022$). A statistically significant relationship has also been found with gender. In females the habit of eating chicken changed to not eating it. ($p=0.017$), but the same relationship was not seen between the habit of eating egg and sex. Gender relation was also present for beliefs: male physicians thought that avian flu was not a threat ($p=0.042$), female physicians were more concerned than male physicians about avian flu ($p=0.009$). It is known that gender is a determinant of social outcomes including health[12]. Intention or motivation to change is one of the most important predictors of behaviour change according to most of the commonly applied theoretical models. A person's intention to change his/her behaviour depends on the belief that "a change in behaviour will reduce health risks" and on the extent to which a person perceives their own behaviour as 'unhealthy'. According to this

theory, for this study, we may say that the more the health professionals believe in their efficiency to reduce the health risk of avian flu, the more they will tend to change their own preventive actions and clinical practices, too[13].

The analysis of the attitudes revealed that 74.3% of the doctors felt responsible and 19.9% "partly responsible" of giving counselling to people. Similarly, in the studies performed in Singapore[14] and Australia[15,] the majority of the doctors, despite their self-health concerns, expressed their sense of personal responsibility and their willingness to provide professional services in an avian influenza and influenza pandemic.

Half (52.6%) of the participant doctors felt competent and 33.3% felt partly competent to give counselling. General practitioners (65.9%) felt themselves more competent than specialist and residents (45.8%) to give counselling (p=0.023) and they thought (50.1%) that sufficient preventive measures had been taken in the country which was different from the opinionof the specialists and residents. This was a supportive result for the feeling of competence of the more knowledgeable group and for their awareness of the preventive measures taken for avian flu. Only 33.7% of all the participant doctors believed that prevention was sufficient. The questionnaire form was designed to assess the knowledge, attitudes and behaviour, but not the preparedness of the staff fo anr avian influenza pandemic. The preparedness should be assessed in another study which will be specifically structured. A systematic review related to self-assessment revealed that "in a majority of relevant studies, physicians did not appear to accurately self assess" and that "weak or no associations between physicians' self-rated assessments and external assessments were observed"[16]. In a qualitative study examining the factors contributing to general practitioners' motivation for change during professional development[17,] the factors were determined as increased knowledge, confidence and competence regarding the situation, and personal insight and development: changing knowledge leads to a change in attitude and insight. As a part of continuous medical development, the knowledge and the counselling skills of the doctors and their feelings of competence should be supported by in-service-trainings and up-to-date information and assessed periodically by external assessments.

In conclusion, doctors have basic knowledge about how the virus is transmitted, symptoms of the avian flu infection in humans, and about the preventive measures that should be taken. The general practitioners who work in primary care services, as they were given information were more knowledgeable and felt more competent to give counselling about the infection. Health personnel should be provided with more information about the agent's characteristics, about the time to start treatment and about the medication, to support early diagnosis and early treatment of the infection. Giving up-to-date information and in-service-training to the health personnel periodically will strengthen national preparedness and will delay international spread of the avian flu virus, which could cause a pandemic throughout the world.

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