ORIGINAL ARTICLE

Dengue knowledge and its management practices among physicians of major cities of Pakistan

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Abstract

Objectives: To assess knowledge and practices related to dengue management among physicians.

Methods: The cross-sectional study was conducted at hospitals in Islamabad, Lahore, Faisalabad, Peshawar, Quetta and Karachi between June and December 2012Physicians from public and private sectors filled a self-administered questionnaire about dengue knowledge and its management practices. A maximum score of 100 was assigned to the knowledge portion. Data was analysed using SPSS 15.

Results: A total of 400 subjects participated in the study; 200(50%) each from public and private hospitals. Of them, 223(56%) were males; 268(67%) were in the 21-30 years age bracket. The highest score was recorded in Quetta 67 followed by 65 in Karachi, 62 in Lahore, Faisalabad, Peshawar and 59 in Islamabad. Of the total, 200 (50%) were not aware that leucopenia is a criterion for diagnosing probable dengue. Similarly 140 (35%) did not know the criteria for diagnosing dengue haemorrhagic fever and warning signs of severe dengue. Total of 204 (51%) were not aware of the criteria for discharging of the admitted cases. There was no significant difference between dengue knowledge of the physicians belonging to public and private sectors ($p>0.05$).

Conclusions: Quite a large number of physicians lacked knowledge of probable diagnosis of dengue and appropriate time to discharge the patients.

Keywords: Dengue, Physicians, Knowledge. (JPMA 65: 392; 2015)

Introduction

Dengue is a mosquito-borne viral infection that causes mild to severe illness and it is estimated that 50-100 million infections occur in over 100 endemic countries, putting almost half of the world's population at risk.[1] Dengue virus is a single positive stranded ribonucleic acid (RNA) virus belonging to family Flaviviradae and it is composed of four serotypes (DEN1-4) which is transmitted to the host by mosquito vector Aedes aegypti.[2] The epidemics of dengue fever have reached almost 120 countries and in many of these it has a high incidence.[3]

In Pakistan, outbreaks of dengue were reported since 1994 to date.[4,5] Dengue fever and its more severe form dengue haemorrhagic fever (DHF) can be caused by any one of the four serotypes (DEN1, DEN2, DEN3, DEN4). Infection with one serotype induces life-long immunity to same serotype, but partial immunity to other serotypes.[6,7] The incubation period of dengue fever (DF) ranges from 3-15 days.[8] Dengue virus infection can result in a range of clinical manifestations from asymptomatic infection to DF and to more severe form i.e. DHF or dengue shock syndrome (DSS).[8] Dengue virus infection can affect other organs such as liver, kidneys, brain or heart.[8,9] There are no specific antiviral treatment for dengue infection and timely fluid and electrolyte replacement therapy is primarily recommended.[10]

A number of studies have been conducted worldwide to assess the knowledge and treatment practices of the treating physicians. A survey conducted in Singapore on 364 primary care physicians reported significant variations in clinical practice according to physician age group and practice settings.[11] Another study conducted in Taiwan on health professionals assessed their knowledge on mosquito-transmitted diseases i.e. malaria, yellow fever and DF, and results showed that there were significant deficits in the knowledge of healthcare providers.[12] A local study from Karachi also showed that physicians had basic knowledge, but were lacking in clinical diagnosis and management and needed training.[13] Another study from Taiwan has shown lack of knowledge among physicians.[14] The current multi-centre study was carried out to assess the knowledge and treating practices in physicians of public and private sectors about dengue cases in Pakistan.

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Subjects and Methods

The cross-sectional survey was conducted from June to Dec 2012 and comprised physicians at private and public hospitals of Karachi, Lahore, Islamabad, Peshawar, Faisalabad and Quetta (Table-1).

Physicians practising in medical wards/units in either public or private sector hospitals were included in the study. Ethical clearance was obtained from the institutional review committees of all the participating hospitals, and a written informed consent was taken from all the participants.

Information was collected on a structured questionnaire adapted from literature.[11] The questionnaire was subjected to peer review and field-tested and refined before being administered. The questionnaire contained two portions; 14 dengue knowledge questions and 13 dengue management questions. Each question was awarded a score of 7.1 except one that was given a score of 7.7, thus making a total of 100.

Data was analysed using SPSS 15. The average knowledge score of all participants was calculated and stratified according to age, settings (public and private) and cities. Chi-square and Fisher's exact tests were used to determine p value which was considered significant if less than 0.05.

Results

A total of 400 subjects participated in the study; 200(50%) each from public and private hospitals. Of them, 223 (56%) were males and 177 (44%) were females. The average age of the participants was 32±8.46 years and (57%) were in the age group of 21-30 years, followed by (26%) in 31-40 years of age, (11%) in 41-50 years, and 25(6.25%) were more than 50 years of age. Of the total, 327 (81%) were MBBS and 73(19%) had post-graduate qualifications.

Overall average knowledge score of physician was 62.5±14.37; the highest was in Quetta 66.8±10.5, followed by 64.9±12.5 in Karachi, 62.2±15.75 each in Lahore, Faisalabad and Peshawar, and 59.2±11.22 in Islamabad. Similarly, the knowledge score of public and private sector physicians was 66.6±13.8 and 58.3±13.7 respectively. Further, 128(32%) scored 71-80, while 71(17.75%) scored below 50, and only 23(6%) participants scored more than 80. No significant difference in the knowledge scores among physicians was observed between public and private sector hospitals of the selected cities.

The distribution of average knowledge score in different age group was 62.4% for physicians <30 years, 60.7% for 31-40 years, and 63% for more than 50 years of age. In terms of qualifications, the knowledge score of post-graduate and graduate degree holders was 60.7% and 62.7 respectively, while it was higher in female physicians (64%) than the males (61.3%). However, no significant difference was recorded in all these categories (p>0.05 each).

Of the total, 56 (14%) did not know that monitoring haematocrit is important. About 140 (35%) were not aware of the criteria for the diagnosis of DHF and 204 (51%) did not know about the criteria of discharging a dengue patient. Of them 200 (50%) were not aware that leucopenia is one of the criteria for diagnosing probable dengue. Almost 136 (34%) did not know that platelet count is one of the criteria for classifying DHF. Total of 76 (19%) thought that classical dengue rash appears on the same day of fever which is not correct and 136 (34%) did not know that persistent vomiting and abdominal pain are warning signs of severe dengue. Among all, 52 (13%) believed that it is not possible for persons older than 65 years to have dengue infection. When asked about the biting time of mosquito, 152 (38%) knew that the Aedes Aegypti typically bites after dark, but an equal 152 (38%) did not know this.

A total of 372 (93%) said that aspirin and non-steroidal inflammatory medications should be avoided in dengue patients as these increase the risk of haemorrhage. About

Table-1: Selected hospitals.

Name of city interviewed	Public Hospital	Private Hospital	Physician's
Islamabad	Pakistan Institute of Medical Sciences , Federal Government Services Hospital	Shifa international	100 (50 each)
Karachi	Civil Hospital	Liaquat National hospital, Ziauddin Hospital, Dow International medical Hospital	100 (50 each)
Lahore	Ganga Ram Hospital, Mazang Hospital	Social Security Hospital. Mian Munshi Hospital, Surraya Azeem Hospital	100 (50 each)
Faisalabad	Allied Hospital DHQ hospital	Aziz Fatima Hospital	40 (20 each)
Quetta	BMC Hospital Sandeman Civil Hospital	Saleem Medical Complex Sajid Hospital, Akram Hospital	30 (15 each)

Table-2: Knowledge on medicines use in dengue patients.

Questions		Overall	Public	Private	P-value
Medications which should be avoided which may increase the risk of haemorrhage i.e	Correct	371 (93%)	195 (97.5%)	176 (88.4%)	0.001
Aspirin and non-steroidal anti-inflammatory	Incorrect	28 (7%)	5 (2.5%)	23 (11.6%)	0.001
Panadol					
Hyperchloraemic Acidosis may results due to the repeatedly excess use of	Correct	132 (34%)	77 (40.5%)	55 (28.4%)	0.003
" Crystalloids	Incorrect	250 (65%)	112 (59%)	138 (71.2%)	0.003
" Colloids					
" Ringer's lactate					
Ringer's lactate (IV fluids) may be avoided in patients.	Correct	199 (50%)	99 (49.3%)	100 (50%)	
having liver disease	Incorrect	201 (50.2%)	101 (50.5%)	100 (50%)	
taking metformin.					
having diabetes					
both 1 & 2					
Use of colloids can cause allergic reactions	Correct	279 (73%)	149 (76.4%)	130 (69.5%)	
Yes No	incorrect	99 (25.9%)	46 (23.6%)	53 (28.3%)	
Fatality rates among patients with dengue shock syndrome can be	Correct	133 (33%)	76 (37.8%)	57 (28.6%	
" 1%	incorrect	267 (67%)	122 (61%)	137 (68.5%)	
" 10%					
" 15%					
Criteria for dengue haemorrhagic fever?	Correct	260 (65%)	149 (74.1%)	111 (55.8%)	
History of fever lasting 2-7 days	Incorrect	139 (34.75%)	51 (25.5%)	88 (44%)	
Any haemorrhagic manifestation					
Thrombocytopenia (platelet count less than 100,000/mm3					
Evidence of increased vascular permeability					
All of the above					
None of the above					
Criteria of discharged if he/she is showing increased trend of platelets, stable hematocrit with no fever in	Correct	198 (49.5%)	108 (53.7%)	90 (45.2%)	
12 hours	incorrect	200 (50%)	92 (46%)	108 (54%)	
24 hours					
48 hours					

Table-3: Knowledge of dengue management.

Questions	Always n (%)	Often	Sometimes	Never	P-value
Do you get/advise a dengue diagnostic test if you suspect dengue?	268 (67%)	95 (23.8%)	32 (8%)	4 (1%)	0.001
How often do you perform a tourniquet test to diagnose dengue infection?	88 (22%)	87 (21.8%)	99 (24.8%)	121 (30.3%)	0.001
How frequently do you perform a full blood count for patients with suspected or confirmed dengue?	339 (84.8%)	54 (13.5%)	6 (1.5%)	1 (0.3%)	
How frequently do you monitor fluid intake in patients with suspected or confirmed dengue on a daily basis?	233 (58.3%)	133 (33.3%)	27 (6.8%)	5 (1.3%)	
How frequently do you monitor urine output in patients with suspected or confirmed dengue on a daily basis?	233 (58.3%)	133 (33.3%)	27 (6.8%)	5 (1.3%)	

264 (66%) did not know that hyperchloraemic acidosis may result due to repeated use of crystalloids. Among them, 200(50%) were not aware that Ringer's lactate (intravenous fluids) should be avoided in patients having liver disease and those taking metformin, and 108 (27%) did not know that use of colloids can cause allergic reactions. Besides, 268 (67%) were not aware that fatality rate among patients with DSS could be as high as 10% (Table-2).

Regarding dengue diagnosis, 90% physicians advised diagnostic tests if they suspected dengue, 292 (73%) used dengue serology (immunoglubolin G & M) and 176 (44%)

performed tourniquet test most of the time. Almost 95% requested complete blood counts (CBCs) frequently for patients with suspected or confirmed dengue. About 344 (86%) physicians reviewed confirmed/suspected cases on a daily basis with 364 (91%) monitoring their fluid intake and output (Table-3).

Only 216 (54%) measured blood pressure of suspected/confirmed dengue patients during the course of illness, and 328 (82%) routinely evaluated laboratory reports (platelet count, liver enzyme). When asked about the importance of platelets for deciding transfusion, 160 (40%) were of the opinion that platelet count is not an indicator for transfusion. Regarding regular review of the patients once they were suspected or diagnosed, 172 (43%) said that they reviewed confirmed dengue patient 2-3 times during the entire course of follow-up.

Discussion

The present study showed that there is lack of knowledge about the dengue disease and its treatment and variations in treating practices were observed among physicians belonging to both public and private sectors. The findings of the study are consistent with other reports from Pakistan. The average dengue knowledge score was 62% which is similar to a study from Karachi which revealed that only 57% of the healthcare providers know the common signs and symptoms of the disease.[15] Similarly, another study from Karachi[13] reported that physicians have basic knowledge of dengue, but need training for clinical diagnosis and management. It was reported from Quetta that knowledge among doctors and healthcare workers (laboratory technicians) was lacking regarding clinical presentation and mode of spread of disease.[16] The average dengue knowledge score of Pakistani physicians was similar to that in Singapore but less than that in Taiwan i.e. 74.4%.[11,12,14]

Almost half of the participants were not aware of the criteria of diagnosing DHF and discharging patients. This might be due to the lack of training and absence of standard guidelines for the treatment of DF in hospitals.[17] Further, dengue disease is a newly emerging infection in Pakistan, therefore, there is a need to launch some special courses or training programmes and workshops for physicians all over the country. This will improve the basic knowledge of physicians about dengue, its proper diagnosis and treatment.

Similarly, most of the physicians were not aware of the criteria for diagnosing probable dengue and classifying DHF based on leucopenia and platelets count respectively. Almost 60% physicians did not know that low platelet count is not an indicator for transfusion. It is reported that there is lack of correlation between thrombocytopenia and risk of bleeding or severe illness due to dengue and there is no benefit of prophylactic transfusion in dengue.[18-21]

Most physicians preferred to perform dengue serology as compared to polymerase chain reaction (PCR) or nonstructural protein 1 (NS1) antigen test. Studies have documented that dengue serology has low specificity and may be falsely negative during the febrile early phase of illness.[22,23] Tourniquet test is recommended for the detection of disease and helps in the early management of DF[8] and it was noted that majority of the physicians were performing this test as routine. Haematocrit is an important indicator of diagnosing DHF[8] which was not being routinely ordered or followed by just 14% physicians. Similarly, regular monitoring of fluid and electrolytes, especially urinary output,[15] is also recommended and in the present study over 80% physicians reviewed dengue cases daily and monitored fluid intake. Leucopenia and lymphopenia are useful predictors of dengue infection during the early phase of the disease[16] and majority of physicians were advising these tests, indicating that guidelines were being followed. This shows good clinical practices and is different from a recent report in which it was shown that tourniquet test and haematocrit are being used infrequently.[24]

Treatment and management of dengue with co-morbidities is a major problem. It was reported that majority of dengue deaths result due to co-morbidities.[25,26] The current study showed that about half of physicians were not aware of the management of dengue patients having liver disease and those taking other medicines like metformin. This shows that physicians have little knowledge about the management of co-morbidities in dengue cases. A recent report showed that 60% dengue-deceased cases had co-morbidities and hepatitis B and C was a major risk of developing DSS.[27] There is urgent need to create awareness regarding dengue management in co-morbid cases due to high prevalence of hepatitis and diabetes in Pakistan.

In terms of study's limitations, the questionnaire used was basically designed for primary care physicians. Secondly, the information about previous training of the physician regarding dengue was not taken and the selection of hospitals and participants was done as per convenience, therefore the finding of the study cannot be generalised.

Conclusions

There is a lack of knowledge about dengue infection, its

diagnosis and management. Further, the physicians were not aware about the management of co-morbid cases. This needs to be addressed on an urgent basis by conducting regular training courses and workshops.

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