

An Outbreak of Cholera In a Dacca City Household

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Summary

A description of the dynamics of spread of a cholera infection within a family is given. An old man went to his village home from Dacca on November 11, 1962, where a good number of persons were suffering from cholera. On the following day he had unaccountable number of rice water stools and vomiting, culminating in his death on November 14. The body was brought back to Dacca on the following day and buried the same night with customary ritual. The clothes of the deceased were later washed on the platform of the dug well.

The daughter of the deceased, who had been attending the old man also arrived at Dacca with her two children on November 15, later had a mild attack of diarrhoea and vomiting on November 17. Examined at later dates, her attack could not be bacteriologically confirmed. Since then there had been ten confirmed cholera cases in the family of 23 members. *Vibrio-cholera* was isolated from dug well and stored drinking water.

Background Information:

The household is located in the southeast part of Dacca City, inhabited by 23 family members including visitors. The family belongs to the mid-socio-economic group. There are three living rooms and one kitchen

in the household. A dug well having a pucca platform caters for the water supply of the family. The source of drinking water is from municipal tap water. The latrine is an open-pit privy discharging to an adjacent canal.

History:

A 65 years old man (Case No. 1; Chart I), who usually resides at Dacca, went to his village house on November 11. There were a good number of suspected cholera cases in the village including a woman in the same house. Being scared, the old man was planning to return to Dacca but before he could materialise his plan he had an unaccountable number of rice watery motions and vomiting from early morning of November 12. Another boy in the same house also felt sick with diarrhoea and vomiting.

Hearing the news, the younger daughter (Case No. 2) of the old man, resident of a neighbouring village rushed to the scene on the same day with her two children (case Nos. 5 and 7) and the husband (non case No. 2) and attended her father. Son of the old man (Case No. 11) reached the village from Dacca on November 14.

The old man was treated in the house by a village quack and did not receive any I.V. fluid therapy till 3.30 p.m. on November,

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13. He was then administered five pints of saline. He died at 8 p.m. on November 14 with signs of dehydration. The dead body was brought back to Dacca in the evening on November 15 by a boat accompanied by his son (Case No. 11) and his brother. The younger daughter (Case No. 2) with her two children and the husband reached Dacca on November 15.

The clothes of the deceased, his bed sheet and blanket etc., used during sickness were collected by his son (Case No. 11) and was kept over-night on the roof of the house. The dead body was then ceremoniously washed in the courtyard on the same day and laid to rest. The clothes that were with the dead body at the time of ceremonial washing were kept in the courtyard overnight, and were washed by the wife of the deceased (non case No. 3) on the platform of the dug well on the following morning. The other clothes of the deceased that were kept over night on the roof of the house were collected by case No. 3 and 9 and were washed by Case No. 11.

The elder daughter of the deceased (non Case No. 9), residing in her husband's village, joined the family at Dacca on November 19 at 6 p.m. along with her husband (non case No. 8) and three children (Case No. 4 and non case Nos. 10, 11) after which there had been no further arrivals to join the family. Subsequently there were ten confirmed cholera cases in the family. A brief recital of the cases is given below:

An 8 years old boy (Case No. 3), felt sick with vomiting and diarrhoea, on November 20. Case No. 4 had the onset at 3 a.m. on November 20 who had joined the family on the previous day at 6 p.m. Diagnosis of

cholera in both cases was bacteriologically confirmed the following day.

Four bacteriologically confirmed cholera cases (Case Nos. 6, 7, 8 and 9) occurred on November 22, two at 3 a.m. and the other two at 4 a.m. and 7 p.m. respectively.

Three more bacteriologically confirmed cholera cases (Case Nos. 10, 11 and 12) occurred subsequently one each on November 24, 25 and 27.

Water samples were collected from the household for chemical analysis and bacteriological culture. Dug well water and municipal tap water stored in the pitcher were infected with vibrio-cholera. Samples for bacteriological examination were collected from the pit of the privy and also from the adjacent canal.

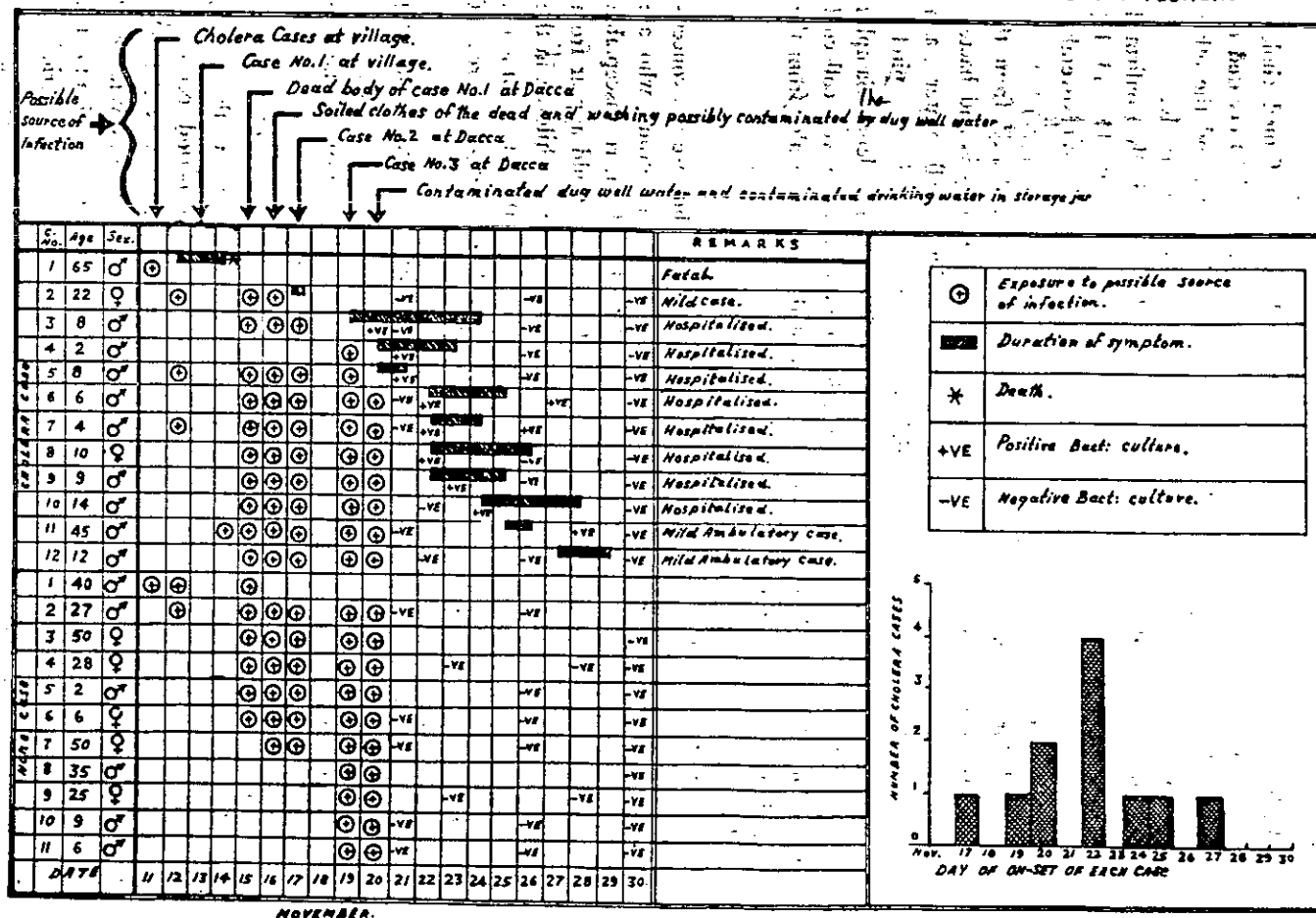
Discussion:

A great majority of the case are concentrated in the younger age group who are considered to be relatively more susceptible to cholera. However, it would appear from Chart I that as many as four children in the non-case group escaped the attack although they were exposed to multiple source of infection.

A spectrum of illness ranging from mild ambulatory cases to severe cases necessitating hospitalisation and fulminating fatal case was encountered in the episode.

Due to introduction of multiple source of infection at different times in the family, calculation of incubation period became a difficult task, except for case No. 4 who joined the family at Dacca on November 19 at 6 p.m. and had the onset at 3 a.m. the following day. The incubation period in this case was less than nine hours.

CHART 1 SCHEMATIC REPRESENTATION OF THE OUT BREAK SHOWING DIFFERENT SOURCE OF INFECTION.



- Corrections:
1. In column of Nov 26 for No. 12 cholera case and Nos 2, 5, 6, 7, 10 & 11 of non cholera cases, read positive instead of ~~negative~~ negative.
 2. For cholera case No 5 read Age 8 months.

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July, 1968

Table 1. Chemical & Bacteriological results of different samples

Date of Collection.	Source.	R e s u l t s					Bacteriology
		Chemical analysis					
		Temp.	P. H.	Alkala- nity	Chlo- ride.	Coli- form per ml.	
20.11.62	Dug well water	26.5°C	6.7	408mg/l	160mg/l	11.00 (M.P.N)	INABA (Gr. I)
20.11.62	Municipal Tap water stored in pitcher.	—	—	—	—	—	INABA (Gr. I)
23.11.62	dug well	—	—	—	—	—	INABA (Gr. I and II).
23.11.62	stored pitcher	—	—	—	—	—	NAG (Gr. IV)
29.11.62	Dug well	26°C	6.6	400mg/l	197 g/l	4.60 (M.P.N.)	NAG (Gr. II)
30.11.62	Pit of the Privy	—	—	—	—	—	NAG
30.11.62	Adjacent Canal	—	—	—	—	—	NAG
5.12.62	Dug well	—	—	—	—	—	NAG (Gr. II)

The occurrence of four cases on the same day, is very suggestive that they have contracted the infection through a common vehicle—contaminated drinking water. In other cases the spread of infection was possibly through personal contact.

Water supply of the family was contaminated. *Vibrio cholera* was isolated from dug well and from stored drinking water.

Morgan *et al.* (1960) in Thailand and Dizon *et al.* (1963), in Philippines reported that multiple illnesses in the same family were uncommon. However, the frequent occurrence of multiple cases of cholera in the

affected families have been observed in East Pakistan, (Pakistan-SEATO Cholera Research Lab, 1965), and the secondary attack rate of cholera in such families with an average size of 8.5 individuals was found to be 8.7%.

A secondary attack rate as high as 47.8% in a family size of 23 was noted in this case. It seems that within favourable circumstances the infection can spread in a dynamic way and can attack an appreciable size of the family members.

Acknowledgement

Thanks are due to Dr. Wiley H. Mosley,

Corrections: 1. In column of Nov 26 for No. 12 cholera case and Nov 27 for No. 13 cholera case, read positive instead of negative. No 20. 2. For cholera case No 5 read Age 8 months.

Chief, Epidemiology Section, Pakistan SEATO Cholera Research Laboratory, Dacca for helpful criticism and advice, and to Dr. R.A. Phillips, Director, Pakistan SEATO Cholera Research Laboratory for permission to publish this paper.

This work was supported in part by research agreement No. 196802 between the National Institutes of Health, Bethesda, Maryland, U.S.A. and the Pakistan—SEATO Cholera Research Laboratory.

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