



## Complications of Measles in paediatric age group: One year retrospective study

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### Abstract:

**Objective:** The aim of this study was to determine the frequency of complications of measles in hospitalized children.

**Methodology:** This hospital based retrospective study was conducted in Sir Ronald Ross Institute of Tropical and Communicable Diseases (SRRIT&CD), Hyderabad from January 2011 to December 2011. All patients who presented with signs and symptoms suggestive of measles according to WHO criteria were included in the study. Information regarding patient age, sex, address, vaccination status, complications and outcome were noted in specifically designed proforma.

**Results:** A total of 587 hospitalized measles patients were included in this study. Out of these 47 patients, 29(61.7%) were males and 18(38.3%) were females, with male to female ratio of. The age range was from > 1 to 15 years. Major complications in descending order of frequency were Bronchopneumonia 27(57.44%), bronchitis 7(14.9%), diarrhoea 6(12.8%), otitis media 2(4.25%), febrile convulsions 2(4.24%), encephalitis 1 (2.13%), tonsillitis 1(2.13%), urinary tract infection 1(2.13%). **Conclusion:** Measles is still a serious threat to our children. Bronchopneumonia followed by diarrhoea and encephalitis are the most serious complications of measles.

**Key words:** Measles, Bronchopneumonia, encephalitis, diarrhoea

### Introduction:

Measles is a serious infection characterized by high fever, cough, coryza, conjunctivitis, and a prominent exanthem. It is caused by Paramyxovirus and genus Morbillivirus. The portal of entry of measles virus is through the respiratory tract or conjunctivae following contact with droplet aerosols in which the virus is suspended. Patients are infectious from 3 days before to up to 4-6 days after the onset of rash. Face-to-face contact is not necessary, because viable virus may be suspended in air for as long as 1 hour after the patient with the source case leaves a room.[1]. The global incidence of measles is 39.9 million cases, 777,000 deaths and 28 million disability adjusted life years [2,3].

Measles remains one of the leading causes of childhood morbidity and mortality in the world, despite the availability of a safe, effective, relatively inexpensive vaccine. It is also one of the leading causes of childhood blindness in the developing world. Acute measles infection at an early age is associated with more complications and increased mortality [4]. The most important complications of

measles which cause morbidity and mortality are bronchopneumonia, otitis media, diarrhoea, croup and encephalitis [5,6]. Pneumonia is the commonest complication of measles [7].

Low coverage and poor vaccine efficiency is strongly associated with outbreaks of measles and its complications and hence high morbidity and mortality. This hospital based study was carried out to determine the frequency of complications of measles in hospitalized children.

### Materials and Methods

This hospital based retrospective study was conducted in Sir Ronald Ross Institute of Tropical and Communicable Diseases (SRRIT&CD), Hyderabad from January 2011 to December 2011. All children who were hospitalized because of measles (587) cases and its complications (47) were included in the study. Clinically, measles was diagnosed in patients with generalized maculopapular rash, fever, cough, coryza and conjunctivitis. Pneumonia was diagnosed by using integrated management of childhood illness criteria

of increased respiratory rate or infiltrates on chest x-ray.

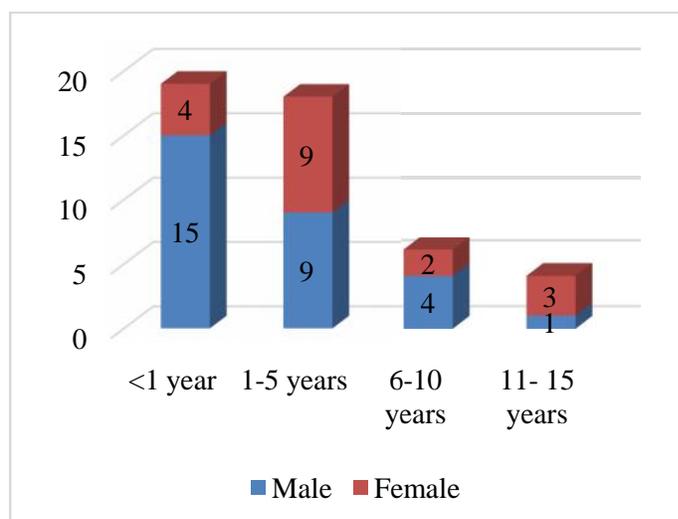
Central nervous system was considered involved if there was lethargy, unconsciousness, fits, neurological deficit. Other problems of measles like diarrhoea, stomatitis, eye complications, febrile convulsions and otitis media were also notified in case sheets. Immunization status was assessed by examining immunization card or parental inquiry in this regard. investigations like chest X-ray, CBC, electrolytes were done where ever required. Data regarding age, sex, immunization, nutritional status, complications and outcome is analysed by using SPSS version 10 for windows.

## Results

A total of 47 hospitalized measles patients with different complications were included in this study. Majority of children 19 (40.24%) were below 1 year of age. Distribution of complications were shown in Graph II. 29 (67.7%) were males and 18 (38.3%) were females with male to female ratio of 1.6:1.

Major complications in descending order of frequency were bronchopneumonia 27(57.44%), bronchitis 7(14.9%), diarrhoea 6(12.8%), otitis media 2 (4.25%), febrile convulsions 2(4.25%), encephalitis 1 (2.13%), Tonsillitis 1(2.13%), urinary tract infection 1(2.13%) each .The morbidity was more in male 29 (61.7%) as well as below 1 year 19(40.42%) and in the non immunised 42(89.36%) as shown in Graph I. There was a positive correlation between lack of immunisation and development of complications.

Graph I: Age distribution of complicated measles patients (n=47)



Graph II: Distribution of complications (n=47)

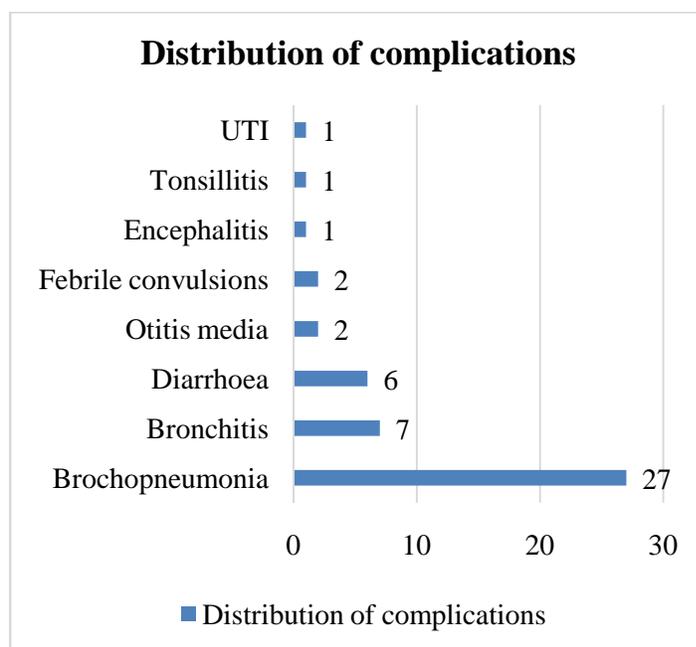
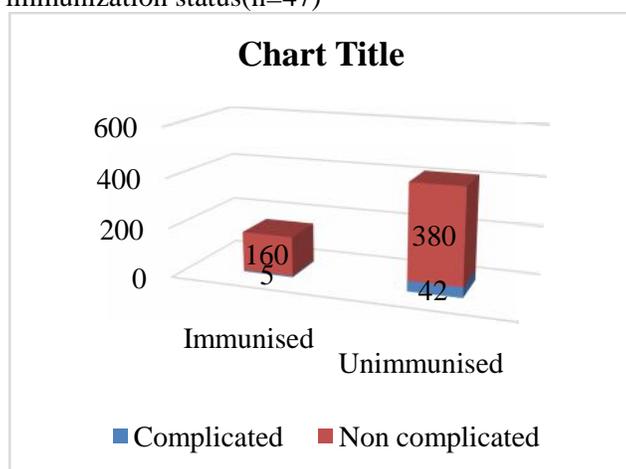


Table 1: Age and genderwise distribution of complicated measles

Complication	<1year		1-5 years		6-10 years		11-15 years	
	M	F	M	F	M	F	M	F
Broncho pneumonia	11 (23.4%)	3 (6.38%)	6 (12.78%)	3 (6.38%)	2 (4.25%)	-	1 (2.13%)	1 (2.13%)
Bronchitis	2 (4.25%)	-	-	2 (4.25%)	2 (4.25%)	-	-	1 (2.13%)
ASOM	-	-	1 (2.13%)	1 (2.13%)	-	-	-	-
Diarrhoea	2 (4.25%)	-	2 (4.25%)	1 (2.13%)	-	1 (2.13%)	-	-
Encephalitis	-	-	-	1 (2.13%)	-	-	-	-
Febrile convulsions	-	1 (2.13%)	-	1 (2.13%)	-	-	-	-
Tonsillitis	-	-	-	-	-	1 (2.13%)	-	-
UTI	-	-	-	-	-	-	-	1 (2.13%)
Total	15 (31.92%)	4 (8.51%)	9 (19.15%)	9 (19.15%)	4 (8.51%)	2 (4.25%)	1 (2.13%)	3 (6.38%)

Graph III: Frequency of morbidity in relation to immunization status(n=47)



The p value is 0.005471. This result is significant at  $p < 0.05$ .

### Discussion

The study demonstrates that majority of cases 19 (40.24%) are below 1 years of age. This is

similar to various other studies abroad and within country. [8-10]. It means that children of this age group are still unprotected. In the present study males were more predominant 29 (61.7%), coinciding with a number of other reports [11-17]. In our study pneumonia is the most common complication 27(57.44%) and Bronchitis is the second most common complication.. This finding is similar to other studies [18-21]. However this finding is contrary to an Indian study [22] in which diarrhea was the commonest complication of measles.

Encephalitis is one of the common complications of measles. In our study only 1 (2.13%) of cases presented with neurological manifestations which is closely simulating the data given by other studies [15,17,20]. Worldwide, acute otitis media is the most common complication of measles. However in our study it was seen only in 4.25% of patients. Khan A[17] reported no case of otitis media in his study. Encephalitis 1 (2.13%) and febrile convulsions 2 (2.13%) were other rare but serious complications observed in this study.

The outcome in measles patients is poor even in developed countries especially when it is associated with complications like encephalitis, severe pneumonia or diarrhea with severe de-hydration. [23]. No deaths were identified in our study. It is similar to other studies [23 - 25] reported no mortality. In India mortality figures were 1-2% in endemic and 3.37% in epidemic situation. [24]

In our study morbidity was mostly seen in younger age group and those with complications like pneumonia and diarrhoea and encephalitis. Almost same risk factors for morbidity were found in other studies as well [17,24,25]. We have observed a positive correlation between lack of immunisation and development of complications.

### Conclusion

In our study pneumonia, diarrhoea and encephalitis are the most common and serious complications of measles in hospitalized children and are mostly seen in non immunised children. Hence improved immunisation coverage is suggested to reduce the morbidity associated with measles.

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### References

1. Mason SWH. Measles. In: Behrman RE, Kliegman RIV, Jenson HB. (Ed). Nelson Text Book of Pediatrics. Philadelphia: W.B Saunders; 19th edition 2011; 1069-1075.
2. Steinc CE, Birmingham M, Kuriam M, Duclos P, Strebel P. The global burden of measles in the year 2000 a model that uses country-specific indicators. *J Infect Dis* 2003; 187: 8-14.
3. Gaffar T, Moshni E, Lievano F. The challenge of achieving measles elimination in the eastern Mediterranean region by 2010. *J Infect Dis* 2003; 187: 164-71.
4. Khan HI, Ahmed TJ. Risk factors for increased mortality in children with complications of measles. *J Coll Physicians Surg* 1999; 9: 247-50.

5. Ibrahim SA, Mustafa OM, Mukhtar MM, Saleh EA, El Mubarak HS, Abdallah A, et al. Measles in suburban Khartoum: An epidemiological and clinical study. *Trop Med Int Health* 2002; 5: 442- 9.
6. Marufu T, Siziya S, Tshimanga M, Murugasampillay S, Mason E, Manyame B. Factors associated with measles complication In Gweru, Zimbabwe. *East Afr Med J* 2001; 3: 135-8.
7. Tariq P. Assessment of coverage level of single dose measles vaccine. *J coll Physicians Surg Pak* 2003; 13: 507-10.
8. Rafi S, Shah IA, Rao MH, Billoo AG. Expanded Program for Immunization in Karachi. *J Pak Med Assoc* 1995; 45: 34-7.
9. Tulloch J. Integrated approach to child health in developing countries. *Lancet* 1999; 354: 16-20.
10. Murray M, Rasmussen J. Measles outbreaks in Northern Pakistan village. *Epidemiology and vaccine effectiveness. Am J Epidemiol* 2000; 151: 811-9.
11. CDC. Surveillance Summaries Measles United States 1991. *MMWR* 1992; 41: 1-12.
12. Huming Y, Chaomin W, Meuh Vitamin A for treating measles in children. *Cochrane Database Syst Rev* 2005; 19: CD001479.
13. Lagunju IA, Orimadegun AE, Oyedem DG. Measles in Ibadan: A continuous courage. *Afr J Med Sci* 2005; 34: 338-7.
14. Rehman AU, Sidique TS, Idris M. Clinical outcome in measles patients hospitalized with complications. *J Ayub Med Coll Abbotabad* 2008; 20(2): 14-6.
15. Muhammad A, Irhsad M, Khan B. A comparative study of measles complications in vaccinated versus non-vaccinated children. *J Postgrad Med Inst* 2011; 25(01): 4-8.
16. Qaiser I, Ahmed A, Ahmed F, Mazhar A. Complications of Measles in well-nourished and malnourished Children. *J Ayub Med Coll Abbotabad* 2009; 21 (2): 30-2.
17. Khan A, Aqeel M, Khattak AA. Measles is still a severe problem in North West Frontier province in Pakistan: study of hospitalized patients. *Med channel* 2009; 15 (4): 140-14.
18. Junejo A A, Abbasi K A, Shiakh AH. Complications of measles in hospitalized children. *Med Channel* 2011; 17(4): 41-4.
19. Albahadle A K J, Abass AA. Measles outbreak in AL-kadhimiya, Iraq, 2008-2009 and its common complications. *IRAQI J Med Sci* 2009; 7(3): 46-51.
20. Aurengzeb B, Nizar Y, Hazir T, Burki F, Hassan M. Clinical outcome in children hospitalized with complicated measles. *J Coll Physician Surg* 2005; 15(9): 547-51.

21. Caksen H, Odabas D, Kose D, Sar S, Tuncer O, Atas B. Measles is still a severe problem in Eastern Turkey. *J Med Assoc Thai* 2004; 87: 386-8.
22. Ray SK, Malik S, Munsri AK, Mitra SP, Baurr B, Kumar S. Epidemiological study of measles in slum of Kolkata. *Indian J Paediatr* 2004; 71: 583-6.
23. HenaoRestrepo AM, Strebel P, Hoekstr E J, Brimingham M, Bilous J. Experience in global Measles Control 1990-2001. *J Infect disease* 2003; 187(Suppl): 515-21.
24. Singh J, Sharma RS, Verghese T. Measles mortality in India: a review of community based studies. *J Com Dis* 1994; 26: 203-14.
25. Jahan S, Saigl A M A, Baker M A M A, Alataya A O, Hamed S A. Measles outbreak in Qassim, Saudi Arabia 2007: epidemiology and evaluation of outbreak response. *J Public Health* 2008; 30(4): 384-90.