Original Article

A Survey Report on Measles in Pakistan

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Abstract

Objective: To study the epidemic condition and to know the cause of the epidemic, treatment being provided and cause of increasing deaths due to measles.

Study Design: Survey report

Place and Duration of Study: Admitted Measles patients in peads department of Jinnah Hospital Lahore, Services Hospital Lahore, General Hospital Lahore, Children Hospital Lahore, Mayo Hospital Lahore, Sir Gangaram Hospital Lahore and Social Security Hospital Lahore during January 2013 to March 2013.

Methodology: Admitted patients in peads department of hospitals were visited patients affected with proper signs and symptoms such as High fever, Generalized Maculo pappular rashes, Conjunctivitis and spots on body were studied. Their prescriptions were studied, the medicines given to reduce severity of the symptoms of the disease including Antipyretics, Antibiotics and Oral Antifungals were studied. They were asked whether they were vaccinated for measles or not and their socio economic status including patients' residing conditions were also studied.

Results: Most of the patients studied in hospitals had post measles complications and some patients were solely affected by measles. Most of the patients studied were vaccinated according to the EPI schedule and rests were partially vaccinated, non-vaccinated, vaccine was not available to them, they did not have awareness and some parents were careless regarding vaccination. Most patients belonged to the poor class making 61.90 %, rest of the patients belonged to middle and lower middle class.

Conclusion: Pneumonia was found to be the most common complication of measles. Most children belonged to poor socio-economic status.

Key words: Epidemic, Measles, Vaccination, Immunization, Children.

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Introduction

Measles an Epidemic Disease

Measles is one of the leading causes of death among young children even though a safe and cost-effective vaccine is available. Measles is caused by a virus in the paramyxovirus family. The measles virus normally grows in the cells that line the back of the throat and lungs. Measles is a human disease and is not known to occur in animals [1]. Measles is still common in many developing countries particularly in parts of Africa and Asia. More than 20 million people are affected by measles each year. The overwhelming majority (more than 95%) of deaths occur in countries with low per capita income and poor health infrastructures. Measles virus is specifically a paramyxovirus of the genus Morbillivirus. These like other paramyxoviruses, are enveloped, single-stranded, negative-sense RNA viruses. The virus is a crystalline structure hemagglutinin, the surface glycoprotein responsible for the binding of measles virus to its host cell receptors. Although the protein lacks neuraminidase activity, its structure resembles a 'dead' neuraminidase fold, presenting spatially distinct receptor-binding sites for its receptors CD46 and SLAM [2].

Aims and Objectives

To survey the prevalence of Measles in Lahore.

Spread of Infection

The main target cells are immune cells such as T and B cells, macrophages and dendritic cells that express CD150 (or SLAM) which serves as an entry receptor [11]. Endothelial cells and neurons are also infectable, but the entry receptors are unknown. It is thought that the first cells infected in the lungs are alveolar macrophages and dendritic cells that transport virus to regional lymph nodes where T and B cells become infected. Dissemination to other areas including spleen, lymphatic tissue, liver, thymus, skin and lungs occurs. The characteristic skin rash is immune-mediated due to infection of dermal capillary endothelial cells and immune complex formation. Measles virus can also penetrate the brain. Infection of pulmonary epithelial cells permits transmission to other hosts [3].

Signs and Symptoms

The first sign of measles is usually a high fever, which begins about 10 to 12 days after exposure to the virus, and lasts four to seven days. A runny nose, cough, red and watery eyes, small white spots inside the cheeks can develop in the initial stage after several days a rash erupts, usually on the face and upper neck.

Over about three days the rash spreads, eventually reaching the hands and feet. The rash lasts for five to six days, and then fades.

On average, the rash occurs 14 days after exposure to the virus (within a range of seven to 18 days) [4].

Incubation Period

An infant who is exposed to the measles virus usually begins showing symptoms about 7 to 18 days after exposure. The infant is contagious for four days prior to and four days after the measles rash occurs [5].

Complications

Most measles-related deaths are caused by complications associated with the disease. Complications are more common in children under the age of five, or adults over the age of 20. The most serious complications include blindness, encephalitis (an infection that causes brain swelling), severe diarrhea and related dehydration [10, 11], ear infections, or severe respiratory infections such as pneumonia [9]. As high as 10% of measles cases result in death among populations with high levels of *malnutrition* and a *lack of adequate health care* [6].

Who is at risk?

Unvaccinated young children are at highest risk of measles and its complications, including death.

Unvaccinated pregnant women are also at risk.

Any non-immune person (who has not been vaccinated or was vaccinated but did not develop immunity) can become infected.

Measles outbreaks can be particularly deadly in countries experiencing or recovering from a natural disaster or conflict. Damage to health infrastructure and health services interrupt routine immunization, and overcrowding in residential camps greatly increase the risk of infection [5].

The MMR Vaccine

The measles, mumps, and rubella (MMR) vaccine is one of the recommended childhood vaccines. This three-in-one vaccine protects against measles, mumps, and rubella, and is required for children to enter school in most states. Children need two doses of the vaccine, while adults need at least one dose.

Facts and Figures

In 2011, about 84% of the world's children received one dose of measles vaccine by their first birthday through routine health services which was 72% in 2000. Two doses of the vaccine are recommended to ensure immunity and prevent outbreaks, as about 15% of vaccinated children fail to develop immunity from the first dose. Measles is a highly contagious, serious disease caused by a virus. In 1980, before widespread vaccination, measles caused an estimated 2.6 million deaths each year. It remains one of the leading causes of death among young children globally, despite the availability of a safe and effective vaccine. Approximately 158 000 people died from measles in 2011 mostly children under the age of five [4].

The fourth Millennium Development Goal (MDG 4) aims to reduce the under-five mortality rate by two-thirds between 1990 and 2015. Recognizing the potential of measles vaccination to reduce child mortality, and given that measles vaccination coverage can be considered a marker of access to child health services, routine measles vaccination coverage has been selected as an indicator of progress towards achieving MDG 4. Overwhelming evidence demonstrates the benefit of providing universal access to measles and rubella-containing vaccines. Globally, an estimated 548000 children died of measles in 2000. By 2011, the global push to improve vaccine coverage resulted in a 71% reduction in deaths. Since 2000, with support from the Measles & Rubella Initiative (M&R Initiative) over 1 billion children have been reached through mass vaccination campaigns about 225 million of them in 2011 [4].

2011 Global Figures

344,276 Reported cases
158,000 Estimated deaths (2010)
84% Estimated vaccine coverage
65% of Countries reached less than 90% Vaccination coverage [4].

Recent Review of Measles Regionally

Europe: 33 countries in Europe have reported more than 6500 cases.
Belgium: 100 cases reported to date compared to 40 cases in 2010
Bulgaria: 131 cases in 2011
France: Reported 4937 cases from January to March 2011
Spain: More than 600 cases reported in October 2011
Macedonia: Reported 636 cases in April 2011
Turkey: Reported 80 cases in January 2011 [7].

Measles in Pakistan

Pakistan is celebrating 2013 as the "Year of Children" but unfortunately since the beginning of this year more than 100 children lost their lives due to a deadly outbreak of measles.
In Pakistan cases of Measles started to report in the later 2012. It basically originated from Rajanpur, Rahim Yar Khan, D.G Khan regions i.e. the regions along the Siraiki belt or the Southern Punjab Region along the Sindh border.
Measles deaths dropped from 542,000 to 158,000 globally between years 2000 to 2011. Representing a 71 per cent decrease.

Alarming Facts

Measles is one of the causes of infertility among males and females. The children who get affected by Measles in childhood (severely) may prove to be infertile at adolescence. Adults are also susceptible to infection whereby the symptoms appear after one month of infection and are more swear. The virus cause swelling of the testes in males and swelling of fallopian tubes in females leading to infertility. Young females are more susceptible to infection as compared with young males [8].

Objectives: To study the epidemic condition and find the cause. The treatment provided to affected patients and cause of increasing deaths due to measles.

Patients and Methods

Seven Public Sector Hospitals of Lahore were visited including Jinnah Hospital Lahore, Mayo Hospital Lahore, Services Hospital Lahore, Sir Gangaram Hospital Lahore, Lahore General Hospital, Children Hospital Lahore and Social Security Hospital Lahore. The admitted patients available in the peads ward of the hospitals were studied. The data entered in the ward registers of the hospitals since January 2013
was obtained, analyzed and Discussed with the physicians.

Table 1: Drugs Used in the Management of

Drugs	Aims
Ceftriaxone	To combat Gram +ve & Gram –ve infections
Paracetamol	To Combat High Fever
Salbutamol	Bronchodilation
Vancomycin	To combat Gram +ve infections
Nystatin	Anti-Mycotic
Miconazole	Anti-Mycotic
Clarithromycin	To combat Gram +ve infections
Furosemide	Loop Diuretic/Pleural Effusion
Ranitidine	H_2–Receptor Antagonist
Metronidazole	To combat anaerobic bacterial and protozoal infections
Ipratropium Bromide	Anticholinergic > Brochodilation
Gentian Violet	To prevent bacterial infections
Vitamin A	To combat malnutrition
Hydrocortisone	Corticosteroid to combat inflammation in Bronchopneumonia
Meropenem	To combat Gram +ve & Gram –ve infections

Measles and its Complications in the hospitals mentioned in the text.

Fig. 1: Patients Studied in Lahore

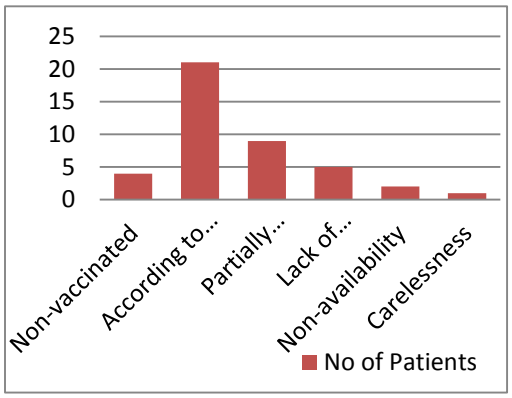


Table 2: Socio economic status

Status	Frequency	Percentage
Non Vaccinated	4	9.5
According to EPI Schedule	21	50.0
Partially Vaccinated	9	21.4
Lack of awareness	5	11.9
Non Availability	2	4.8
Carelessness	1	2.4

Fig. 2: Vaccination status of patients

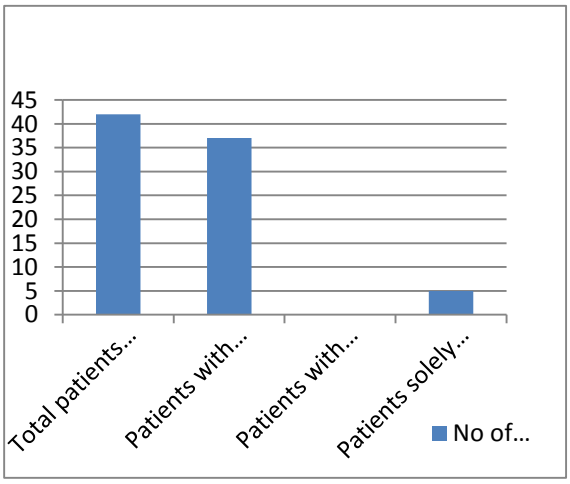
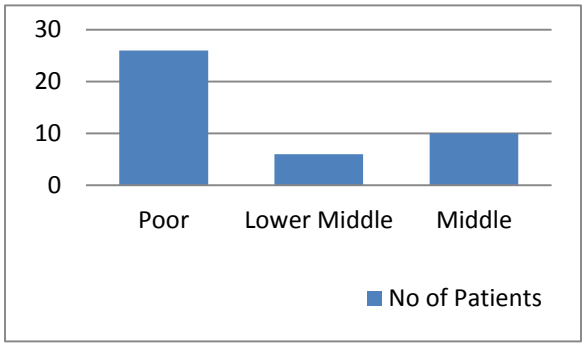


Table 3

Class	Frequency	Percentage
Poor	26	61.90
Lower Middle	6	23.81
Middle	10	14.29

Fig. 3: Socio economic status



Survey Points

In the hospitals quarantine conditions were maintained but those could be more improved.

Proper data was maintained of the reported patients.

The patients being reported were well handled and managed.

There was no shortage of medicines.

In case if some drug/medicine was unavailable then it was arranged via the local purchase (LP) department of the hospitals at the earliest.

Most of the patients were brought to the hospitals when the complications of measles had gone worst.

It was observed that parents don't bother about the initial symptoms of measles and they do not take it seriously and go for household remedies instead of rushing to hospital.

Bronchopneumonia is majorly observed while meningitis is not significant

- Parents of children were somewhat unaware to keep the patient isolated from healthy children
- The patients from far-flung areas were not properly vaccinated(2^{nd} shot was missing) and some patients were there those did not even received a single shot of the vaccine
- Majority of patients belonged to small houses of one or two rooms where proper quarantine conditions could not be maintained
- Some cases are seen in which whole family (children) were affected
- A significant number of patients were not belonging or residents of Lahore
- MMR vaccine was short(out of stock) in the local market

Results

Patients included in the study and final analysis were 42. Patients with complications of bronchopneumonia were 88%. Patients with the complications of Meningitis were 0% and patients solely with measles were 11%.

Out of the total patients studies 4 patients are not vaccinated making 9.5% of the total 42 patients studied; they have not received any shot since their birth. Patients who were vaccinated in accordance with the EPI (Extended Program on Immunization) schedule were 21, making 50% of the patients studied. Patients who were partially vaccinated, they had received at least one shot of the vaccine since their birth were 9, making 21.4%. Patients who were unaware of the importance of vaccination were 5, making 11.9%. Patients to whom vaccination was not available due to their circumstances were 2, making 4.8%. Patient that did not get vaccinated due to the carelessness of the parents was 1, making 2.4%

Socio economic status is an important factor and it influences the spread of the infection.

The patients studied belonged to the poor class were 26 with poor living conditions and also poor diet, the patients belonging to the middle class were 10 these were comparatively better in their living conditions and diet and the patients belonging to the lower middle class were 6. They have living conditions and diet in between those of the poor class and the middle class. The respective percentages of the poor, the middle class and the lower middle class were 61.90, 23.81 and 14.29.

Discussions: The main cause of the spread of disease is the poor sanitary and living conditions. It originated in the southern Punjab regions including Rajanpur, Rahim Yar Khan, Sadiqabad & D.G Khan Regions and spread all over the Punjab. In these remote areas EPI has

poor coverage due to untrained staff, law & order conditions etc. Children were partially/non-vaccinated. The cold storage required for storage of vaccination is not intact. The affected patient is not kept in isolation in the small houses of the poor people and it affects other children in family. The reason for death of children is that the patient is reported in the hospital when he/she exhibits worse symptoms of broncho- pneumonia and/or meningitis, this is due to negligence of parents.
Immediate hospitalization upon appearance of rashes may help in controlling the mortality rate drastically.

Conclusion: Pneumonia was found to be the most common complication of measles. Most children belonged to poor socio-economic status.

Suggestions
The following suggestions are laid down for further improvement in the system.

- Public awareness to be created by means of print or electronic media.
- EPI to be made more effective and vigilant in remote rural areas.
- Community health centers should be made practically available for public with proper facilities.
- Proper transportation of vaccine import should be practised according to WHO rules by the EPI.

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