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A CASE CONTROL RESEARCH ON MEASLES INFECTION WITH ASSOCIATED COMPLICATIONS WITH REFERENCE TO THREE EPIDEMIC OUTBREAKS IN CONGESTED LIVING COMMUNITIES

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Abstract:

Objectives: *Our research aimed at the measles associated risks specifically linked with the three back to back epidemics that affected Lahore city affecting children.*

Methods: *Our research was based on the case-control design with a proportion of one to one with purposive sampling technique held at Services Hospital, Lahore (September, 2015 to February, 2017).*

Results: *We divided total sample of one hundred patients in to cases and controls having fifty patients each with description of the demographic features. We also estimated the risk factors with confidence interval (CI) as 95% and odds ratio (OR). Application of logistic regression analysis was made at significant (alpha 0.05).*

In the cases group children (above nine months) were (89%) including males as (57%) and females as (43%). These cases were selected on the basis of non-availability of vaccine, socio-economic status and educational level respectively observed as 75%, 83% and 63%. Hospitals and dispensaries vaccinated 55% of the total population and remaining were vaccinated by mobile teams. Breastfeeding and epidemic area travel history was observed in 66% and 79% respectively. Vit-A deficiency and coexisting illness was observed in 28% and 30% cases. Confidence lack was observed in 24% of the parents about immunization program. Sick mothers were observed as 19%. Significant lack of cold chain, awareness and malnutrition were also observed.

Conclusion: *There was a significant lack about the expanded immunization program, surroundings transmission and coexisting illness were significant in the epidemic of measles in the given population.*

Key words: *Risk Factors, Measles, Contagious, Immunization, Preventable Disease and Transmission.*

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INTRODUCTION:

According to the definition of Mason WH, measles is a contagious airborne disease which is caused by a virus known as Rubeola specifically dangerous in the children caused death in under developed countries [1]. The incubation time of 8 – 10 days has been reported by WHO, 2010 [2]. Fever, runny nose, cough or conjunctivitis are its prodromal signs which also develop into generalized rash with spots of Koplik inside mouth which can be confirmed through serological assessment. Its infectivity time is between 4 – 5 days which is followed by rashes. Risk factors include pregnancy, Vit-A deficiency, immunodeficiency is considered as risk factors. Whereas, bronchitis, otitis media, encephalitis and pneumonia were among major complications. Severity can be controlled through analgesics, humidified air, bed rest and Vit-A supplements. Measles can be better controlled by regular immunization [3].

According to Aldous, Benson, Schneider-Schaulies, Meulen and Takasu observed that deaths were caused in the non-vaccinated patients [4 – 7]. Punjab reported 7784 measles cases in 2013 [8]. Various deaths proportions have been reported in the previous years because of measles [9]. Awareness lack is among the well-known barrier in vaccination. A French author describes that well aware population can better fight measles infection [10]. Orenstein W.A is of the view that immunity induced because of vaccine began to wane after ten years [11]. According to the research of Wasif S in Pakistan 7000 laboratories were used to diagnose the disease of measles, no vaccine was given to (60%) of children; whereas, one dose was given to (20%) although awareness was spread about the disease. Under 5 years (68%) cases were observed and Under ten years (32%) cases [12]. Moreover, non-immunization was among the most repeated reason for measles infection as stated by Roberts RJ and previous measles infection, incomplete immunization and side effects concerns were respectively observed as 62.50%, 33.62% and 23.70% [13].

According to WHO, there is a global threat of measles as reported deaths are 139,000 [2]. More affected areas of Pakistan include Hyderabad, Shikarpur, Ghotki, Jacobabad, Kambar-Shadadkot, Larkana, Kashmore, Sukkur et. and Punjab is also no exception to that [14 – 16]. Major issues were because of the non-availability of the nursing staff, doctors and vaccines including failure of cold chain maintenance [17]. Preventive strategies are required with additional awareness programs to counter the infection of measles [18 – 19]. Our research aimed at the measles associated risks specifically linked with the three back to back epidemics that affected Lahore city affecting children.

MATERIALS AND METHODS:

Our research was based on the case-control design with a proportion of one to one with purposive sampling technique held at Services Hospital, Lahore (September, 2015 to February, 2017). Two groups were made out of the total sample population respectively cases and controls. All the cases who fulfilled the preliminary criteria were included in the research. We did not include all the children who were suffering from chronic disease from previous three months. Both groups were matched for geographic, demographic and educational distribution. The aim of the EPI was to reduce the infection through vaccination against the Poliomyelitis, Diphtheria, Tetanus, Measles, Pertussis, Hib Pneumonia, Hepatitis – B, Childhood Tuberculosis and Meningitis [20]. Temperature was maintained through refrigerators and hand carriers [21]. Every subject was observed with a history of stay or travel at epidemic area in last five months period. We also considered possible hindrance in the program such as flood or any other natural disaster. We also mentioned prior coexisting illness that developed the infections of measles.

RESULTS:

We divided total sample of one hundred patients in to cases and controls having fifty patients each with description of the demographic features. We also estimated the risk factors with confidence interval (CI) as 95% and odds ratio (OR) (Table – II). Application of logistic regression analysis was made at significant (alpha 0.05) (Table – I).

In the cases group children (above nine months) were (89%) including males as (57%) and females as (43%). These cases were selected on the basis of non-availability of vaccine, socio-economic status and educational level respectively observed as 75%, 83% and 63%. Hospitals and dispensaries vaccinated 55% of the total population and remaining were vaccinated by mobile teams. Breastfeeding and epidemic area travel history was observed in 66% and 79% respectively. Vit-A deficiency and coexisting illness was observed in 28% and 30% cases. Confidence lack was observed in 24% of the parents about immunization program. Sick mothers were observed as 19%. Significant lack of cold chain, awareness and malnutrition were also observed.

Table – I: Bivariate Analysis and Chi-square test to show association of risk factors with measles.

Risk Factors	Details	Measles Epidemic		Bivariate analysis			Chi-Square Value
		Case (50)	Controls (50)	Crude Odds Ratio	95% CI		
					Lower	Upper	
Age of Patient	< 9 Months	9	2	0.19	0.039	0.929	5.005
	> 9 Months	41	48				
Gender of patient	Male	30	27	0.783	0.354	1.73	0.367
	Female	20	23				
Education of patient's mother	Educated	27	36	2.19	0.954	5.028	3.475
	Uneducated	23	14				
Family income	> 5000/month	42	41	0.868	0.305	2.467	0.071
	< 5000/month	8	9				
Religion of the patient	Non-Muslims	1	2	2.042	0.179	23.266	0.344
	Muslims	49	48				
Lack of vaccination availability	Available	38	37	0.899	0.363	2.224	0.053
	Not Available	12	13				
Lack of measles immunization	Vaccinated	20	33	2.912	1.29	6.571	6.784
	Not Vaccinated	30	17				
Lack of cold chain maintenance	Maintained	26	29	1.275	0.579	2.807	0.364
	Not Maintained	24	21				
History of breast feeding	Yes	31	35	1.43	0.622	3.286	0.713
	No	19	15				
Lack of hygiene	Maintained	43	44	1.194	0.371	3.841	0.088
	Not Maintained	7	6				
Travel history in epidemic area	No	7	14	2.389	0.87	6.556	2.954
	Yes	43	36				
School going child	No	29	18	0.407	0.182	0.912	4.857
	Yes	21	32				
Transmission from school, home or vicinity	No	32	38	1.781	0.747	4.246	1.714
	Yes	18	12				
Hindrance to immunization (natural disaster)	No	49	49	1	0.061	16.444	0
	Yes	1	1				
Coexisting illness	No	39	33	0.548	0.225	1.332	1.786
	Yes	11	17				
Lack of medication for coexisting ailment	Taken	48	48	1	0.135	7.392	0
	Not Taken	2	2				
Lack of vitamin A intake	No	33	39	1.826	0.751	4.443	1.786
	Yes	17	11				
Lack of awareness about measles in parents	No	31	32	1.09	0.484	2.455	0.043
	Yes	19	18				
Health status of mother during pregnancy	Healthy	38	43	1.94	1.693	5.43	1.624
	Sick and Treated	12	7				

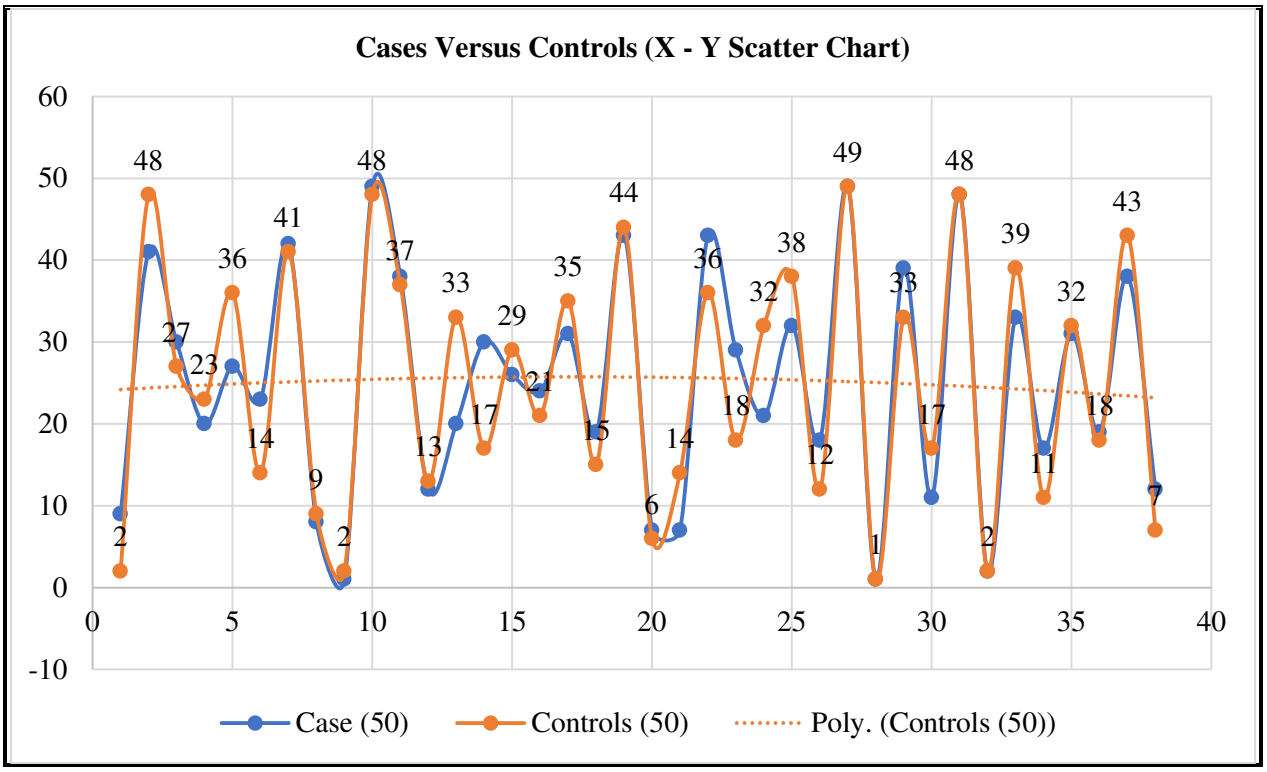
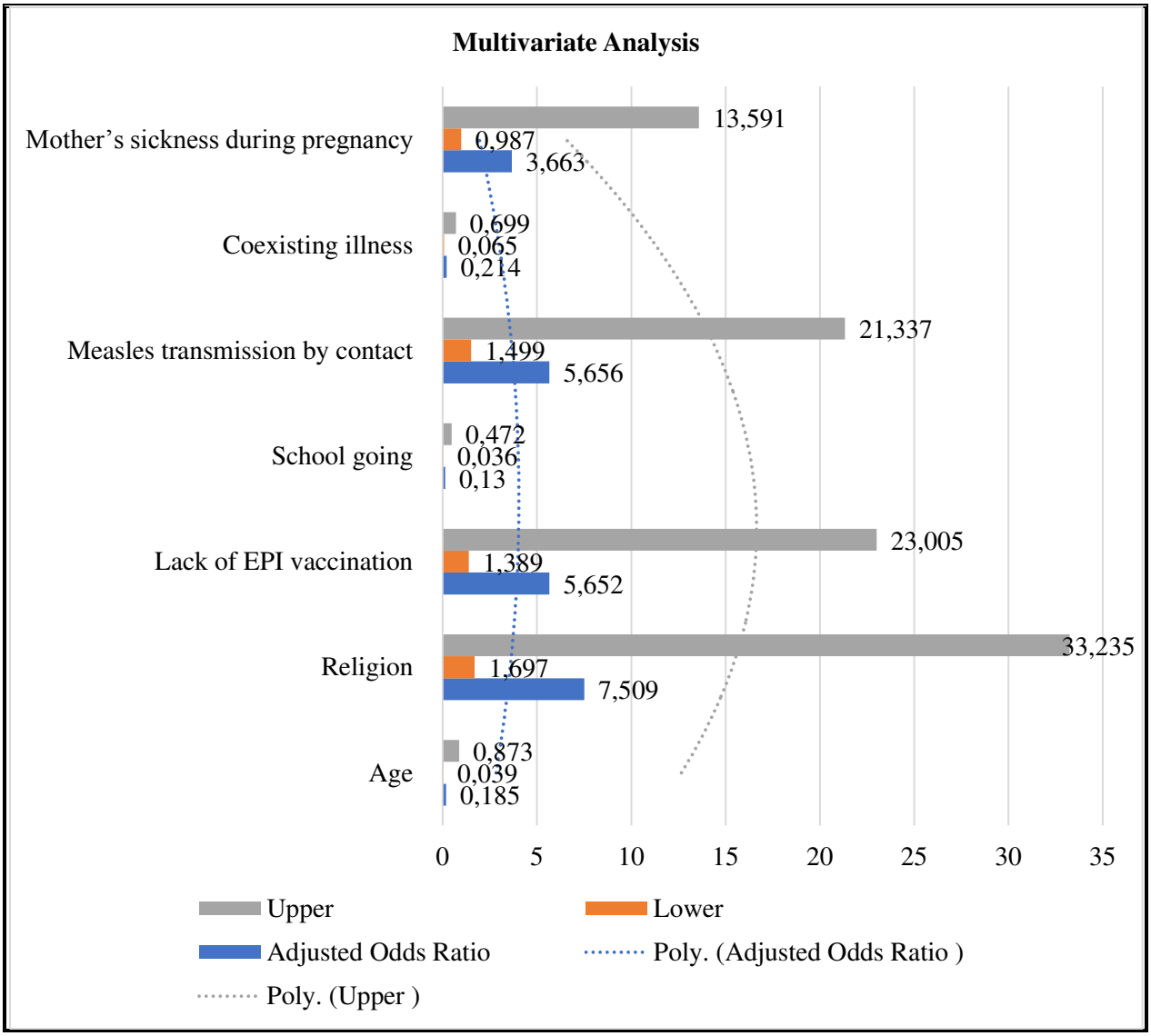


Table – II: Multivariate analysis to show association of risk factors with measles

Risk Factors	Multivariate Analysis			P-Value
	Adjusted Odds Ratio	95% CI		
		Lower	Upper	
Age	0.185	0.039	0.873	0.033
Religion	7.509	1.697	33.235	0.008
Lack of EPI vaccination	5.652	1.389	23.005	0.016
School going	0.13	0.036	0.472	0.002
Measles transmission by contact	5.656	1.499	21.337	0.011
Coexisting illness	0.214	0.065	0.699	0.011
Mother's sickness during pregnancy	3.663	0.987	13.591	0.052



DISCUSSION:

Measles is a respiratory tract acute viral infection that is presented with cough, fever, rash and runny nose with numerous complications such as otitis media, bronchitis, pneumonia and encephalitis. Recent three back to back epidemic attacks have created an alarming situation and increased death rate in children. Various populations present various affects. Children above nine years of age were affected most in this series; whereas, according to another author the age group of under five years was mostly affected. Measles can be very severe when transferred maternally and in the weak immunity cases as proposed by various research studies [23 – 26].

Males were predominant on females in our research 57% against 43% which is contrary to the maternal deaths as reported by Garenne M (1994). Middle socio-economic status was observed much involved in our research (83%) (with income under five thousand). Same results have been reported by Perry RT [28].

Death risk is increased in the congested livings than the ventilated ones as observed in a research held at Bangladesh [29]. According to Carrillo – Santistive P and Senzoga practice and awareness gap was observed as the determinant of measles [30, 31]. Vaccination was received by fifty-five percent of the patients through hand carriers and refrigerators available at hospitals, dispensaries and mobile teams. According to a general published by WHO, antibodies are contained in breast milk, micronutrients and vitamins that actively protect the children against the infection of measles [32].

Sound personal hygiene's are very helpful for the prevention of disease spread [33]. Epidemic area travel and disease history has a close association with the measles infection as observed (79%) in our research and can be compared with the research held by Katz SL [34].

Infected children are to be kept away from other non-infected children who are not-immunized [35]. French author also proposed that relatives who are in close contact with the infected patients also need vaccination [10]. Annual data has been assessed by UNICEF and WHO which was reported by the offices of the government as one-year old children were not vaccinated (20.1 millions) and among five assessed countries (11.1 million, 55%) including Pakistan (0.9 million). Simons E assessed inaccessible cases because of various reasons such as flood affected cases (2%) [18].

WHO fact sheet reports five major causes which attribute children mortality included childhood pneumonia, measles, diarrhea, malnutrition and malaria. The death rate was observed as seven out of ten in the under developed countries [36]. We also observed thirty percent of the cases were observed with cough, anemia, pneumonia or diarrhea as measles's coexisting illness. Another increased incidence was the deficiency of Vit-A faced by the under developed countries. According to Hussey GD Vit-A deficiency was reported in hospitalized cases including additional measles complications such as pneumonia or diarrhea [18]. Vit-A was deficient in 28% of the children as observed in this research because of their dietary habits.

It was concluded in a French research that second MMR dose potential barrier was vaccines fear with associated side effects (50%) [36]. Which can be compared with our research which showed confidence lack about the immunization program in the patients.

CONCLUSION:

There was a significant lack about the expanded immunization program, surroundings transmission and coexisting illness were significant in the epidemic of measles in the given population.

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