

"Complications and risk factors in children with severe measles"

Abstract :

measles causes a mild disease in vaccinated children, whereas unprotected children can suffer complications that end in severe repercussions and even death. Although the introduction of the measles vaccine has lowered the number of cases and the spread of the virus, the current decline in vaccination rates has led to the disease's comeback. Currently measles vaccination rate is below the 95% threshold deemed safe. Thus, an outbreak began in 2016 and is still ongoing, with numerous paediatric cases detected in the Western region. Our goal was to undertake a comprehensive analysis of the clinical features, progression, and risk factors of vaccinated and unvaccinated children in this location. To achieve our goals, we employed a retrospective cohort study. Infectious disease and pulmonary medicine. We discovered a total of 136 measles cases among the youngsters admitted to this facility. The two comparison groups included 104 children under the age of 10 and 32 patients between the ages of 10 and 18 years. An noteworthy aspect of both study groups was the high incidence of patients' ethnicity, which, although being a minority, was over 40% in the current study. Measles-infected individuals frequently develop measles pneumonia, a potentially fatal lung infection. The fact that the vast majority of hospitalised children with measles were unvaccinated is a major cause for concern among patients. Almost forty percent of these inpatients identified themselves as members of this community. Pneumonia was a major complication for these patients and should be avoided by paying strict attention to risk factors such as age, poor nutrition, anaemia, and procalcitonin levels. There are numerous effective treatments for pneumonia, but prevention remains the best medication. When parents express reluctance about vaccinating their children, doctors should take the time to listen and address any questions or concerns they may have, which has the lowest vaccination rate, as this is an excellent opportunity to educate parents and move toward total eradication through vaccination.

Keywords: severe measles, risk factors in children, Complications

المخلص:

تسبب الحصبة مرضًا خفيفًا عند الأطفال الذين تم تطعيمهم ، بينما يمكن أن يعاني الأطفال غير المحميين من مضاعفات تنتهي بعواقب وخيمة وحتى الموت. على الرغم من أن إدخال لقاح الحصبة قد قلل من عدد الحالات وانتشار الفيروس ، فقد أدى الانخفاض الحالي في معدلات التطعيم إلى عودة المرض. معدل التطعيم ضد الحصبة حاليًا أقل من 95% التي تعتبر آمنة. وهكذا ، بدأ تفشي المرض في عام 2016 وما زال مستمرًا ، مع اكتشاف العديد من حالات الأطفال في المنطقة الغربية. كان هدفنا إجراء تحليل شامل للميزات السريرية والتقدم وعوامل الخطر للأطفال الذين تم تطعيمهم وغير الملقحين في هذا الموقع. لتحقيق أهدافنا ، استخدمنا دراسة جماعية بأثر رجعي. الأمراض المعدية والطب الرئوي. اكتشفنا ما مجموعه 136 حالة حصبة بين الشباب الذين تم إدخالهم إلى هذه المنشأة. تضمنت مجموعتنا المقارنة 104 أطفال تقل أعمارهم عن 10 و 32 مريضًا تتراوح أعمارهم بين 10 و 18 عامًا. كان أحد الجوانب الجديرة بالملاحظة في مجموعتي الدراسة هو ارتفاع معدل حدوث الانتماء العرقي للمرضى ، على الرغم من كونه أقلية كان أكثر من 40% في الدراسة الحالية. كثيرًا ما يصاب الأفراد المصابون بالحصبة بالالتهاب الرئوي الناتج عن الحصبة ، وهو عدوى رئوية قاتلة. حقيقة أن الغالبية العظمى من الأطفال المصابين بالحصبة في المستشفى لم يتم تلقيحهم هو سبب رئيسي للقلق بين المرضى. عرّف ما يقرب من أربعين بالمائة من هؤلاء المرضى الداخليين أنفسهم على أنهم أعضاء في هذا المجتمع. كان الالتهاب الرئوي من المضاعفات الرئيسية لهؤلاء المرضى ويجب تجنبه من خلال إيلاء اهتمام صارم لعوامل الخطر مثل العمر وسوء التغذية والعرق وفقر الدم ومستويات البروكالسيتونين. هناك العديد من العلاجات الفعالة للالتهاب الرئوي ، لكن الوقاية تظل أفضل دواء. عندما يعبر الآباء عن عدم رغبتهم في تطعيم أطفالهم ، يجب على الأطباء تخصيص الوقت للاستماع ومعالجة أي أسئلة أو مخاوف قد تكون لديهم ، الذين لديهم أقل معدل تطعيم ، لأن هذه فرصة ممتازة لتثقيف الوالدين والانتقال نحو الاستئصال التام من خلال التطعيم.

الكلمات المفتاحية: الحصبة الشديدة ، عوامل الخطر عند الأطفال ، المضاعفات.

Introduction:

Measles is an acute, extremely contagious disease that can be transferred through the air. It can have serious side effects. The family Paramyxoviridae includes the genus Morbillivirus, which contains the measles virus. Measles is diagnosed clinically when a patient has a rash that lasts for at least three days, a fever that lasts for at least one day and is often above 40 degrees Celsius, and at least one of the three Cs: cough, coryza, or conjunctivitis (Krupka, 2022). The measles virus was responsible for millions of fatalities before the vaccination was developed. Measles was once ubiquitous, but routine immunisation programmes have made it a rarity in many nations. The incidence of measles fell from 88.5 per 100,000 in 1984 to 6.9 per 100,000 in 1991 after the monovalent measles vaccine was successfully implemented as part of the National Childhood Immunization Programme. In 1992, 1993, and 1997, there were resurgences of measles. Measles cases dropped substantially to 2.9 per 100,000 in 1998 after a "catch-up" vaccination programme utilising the trivalent measles, mumps, and rubella (MMR) vaccine was carried out in 1997, followed by the introduction of the two-dose immunisation schedule in January 1998. For the first dosage, vaccination coverage was kept at 95%, and between 92% and 94% for the second. The first dose of the measles, mumps, and rubella (MMR) vaccination was moved forward from 15 to 18 months to 12 months of age, and the second dose was moved up from 6 years to 15-18 months, as part of an amendment to the national immunisation schedule made in December 2011 (Misin et al., 2020).

A lot of kids get measles every year. According to WHO's most up-to-date estimates, over 30 million new cases and 700,000 deaths occur annually in low-income regions. Complications from measles, including as pneumonia, diarrhoea, and malnutrition, account for a large portion of the mortality of children in these nations. When health care providers diagnose a child's sickness, they may mistakenly label it as something like "pneumonia" or "diarrhoea," not realising that it is actually a consequence of measles (Dalziel et al., 2016).

The effects of measles can be felt for years after exposure. These include chronic lung disease, malnutrition (marasmus or kwashiorkor), failure to thrive, and recurring infections; blindness (measles is responsible for almost half of the cases of blindness in children in Africa); and blindness. In addition, the risk of secondary infections and death is elevated for months after the initial measles infection has subsided. A toddler who went blind from measles is seen on this slide. A person can go blind from measles for a few different reasons: the virus itself, a secondary infection, or a lack of vitamin A brought on by the disease (Dalziel et al., 2016).

By the time they reach the age of 5, all unvaccinated children in nations with low immunisation rates will have contracted measles. The majority of fatalities (almost half) occur in children younger than one year old. In modern, industrialised nations, measles primarily affects teenagers and young adults who were either never inoculated as children or whose primary vaccinations failed. People living in poverty in metropolitan settings, where immunisation rates are low and crowding plays a role in the spread of diseases, are at a heightened risk of contracting measles. The delivery of immunisations and other health services to these youngsters requires extra effort (Laksono et al., 2016).

The Morbillivirus, a member of the family Paramyxoviridae, is responsible for the extremely contagious disease known as measles. The infectious droplets produced by coughing and sneezing go to other people. Measles RNA can be detected in blood, urine, and nasopharyngeal mucosa for extended periods of time, even months after the rash beginning, making the prodrome, lasting 3-5 days after rash onset, the most contagious period. Peak infectiousness occurs when the virus is replicating largely in the upper respiratory tract rather than the lower respiratory tract. Epidemic waves of measles are characterised by seasonality; they tend to peak in the winter and coincide with social risk factors like large gatherings of people in closed locations like schools and shopping malls. Because of an upward tendency in vulnerable non-immunized people during prior outbreaks, measles epidemics appear to be characterised by prolonged cycles of several years. Many studies have found that the birth rate is another crucial factor in the cyclicity and duration of epidemics (Laksono et al., 2016).

The incubation period for measles is typically 10-14 days, commencing 4 days before to the onset of the rash and ending 4 days after it first shows. The period of more intense coughing coryza is associated with higher viremia levels, which in turn increase the number of droplets produced by the coughing and hence the likelihood of viral transmission. Since the virus does not cause any known infections in animals and cannot be detected in animal reservoirs, it can only persist in human populations through unbroken transmission chains. Patients with diseases that are not particularly difficult may experience rapid and complication-free recoveries. However, up to 60 out of every 1000 individuals get measles-related pneumonia or subsequent bacterial pneumonia, and encephalitis and middle ear infections are also possible (López-Perea et al., 2021).

Nowadays, anyone of any age can get measles; it's no longer regarded a sickness of children only. Complications are more likely to occur in patients older than 20 who were not vaccinated or who were not immunised at all, or in areas where vaccination coverage is less than the minimum necessary 95% to prevent viral spread. In communities who have received two doses of measles vaccine, the age structure of measles infection has shifted towards adolescence and adults as a result of recent immunisation techniques. Because of this change in the age distribution of the epidemic,

measles has spread more rapidly in regions with low vaccination coverage and in hospital settings where susceptible people are not vaccinated, such as the very young and patients with numerous comorbidities (López-Perea et al .,2021).

RISK FACTORS FOR SEVERE COMPLICATED MEASLES:

Some kids who get infected with the measles virus might not even show any symptoms at all. While this is good news for the kid, it complicates the clinical diagnosis. Some children with measles may have a severe, complicated form that causes them to be much sicker than others. There are three groups of children who are more likely than others to experience life-threatening complications from measles:

- infants and toddlers, especially those younger than a year old.
- those who are undernourished (children with marasmus or kwashiorkor).
- Those who are vulnerable to a high viral load include: • the urban poor; refugees living in cramped conditions.
- children with HIV infection, malnutrition, or cancer who have weakened immune systems.
- people with inadequate vitamin A intake (Ferren et al .,2019).

Because of the gaps in treatment for children with measles, there is a higher chance that complications will worsen to the point of death if they are not treated. Even if there is a medical facility in the area, many parents still delay taking their sick children there until it is too late. Lack of vitamin A compromises the immune system and damages the cells that line the gastrointestinal tract and the lungs. As a consequence of the damage it causes, infection control and prevention are compromised. Increased measles complications and mortality have been linked to vitamin A deficiency (Kasundriya et al .,2020).

This slide from the former Zaire shows the correlation between vitamin A deficiency and measles-related mortality (current DRC). For children under the age of two, the risk of death from measles infection doubled if their vitamin A levels were very low.

Measles cases in children with low vitamin A levels have been linked to an increased risk of hospital admission and severe disease in the United States, where clinical vitamin A deficiency is extremely uncommon. Complications from respiratory illnesses such as croup, pneumonia, and diarrhoea can be mitigated with vitamin A therapy. Children who take vitamin A supplements spend less time in the hospital (Manolescu et al .,2022).

Measles typically takes 8-12 days to incubate. High fever, nasal discharge, cough, conjunctivitis, and Koplik spots are all symptoms of the illness that comes before the rash (prodromal illness²) (tiny whitish-blue spots on the lining of the inside of the cheeks, opposite the molar teeth). After these signs and symptoms, a characteristic red rash appears, usually beginning behind the ears and at the hairline and eventually extending to the rest of the body, including the arms and legs. The spots tend to merge into larger blotchy areas. After 3–4 days, the fever lowers, and the rash disappears, leaving behind only skin discoloration (post-measles staining). There is a high probability that the skin will peel off, and it may continue to do so for a few weeks (Manolescu et al .,2022).

COMPLICATIONS:

Measles complications are described. Rare problems are typically more severe and necessitate hospitalisation and the attention of a specialist. If pneumonia, diarrhoea, or croup develops within the first week after the rash appears, the measles virus itself may be to blame. Complications that arise later in the course of an illness are more likely to be fatal because they are more severe, generally result from subsequent viral or bacterial infections, and occur much more rarely when they do. Lack of appetite, such as in the case of malnutrition, may be caused by oral ulcers. In addition, parents may be unaware of how crucial it is to keep their sick child nourished. As a result, the youngster is more likely to get an infection as a consequence. Measles, subsequent herpes or bacterial infection, chemical conjunctivitis due to improper and unsuitable topical medication, or vitamin A deficiency are all major causes of eye issues in low-income populations (Bogdan et al .,2022).

Weight loss (seen on this slide), recurring infections, and prolonged pneumonia and diarrhoea can all delay recovery from acute measles by weeks or months. Children should visit a clinic at least once a month for at least six months to have their growth monitored and have any issues identified and treated at an early stage because the death risk of children is dramatically raised during this phase (Bogdan et al .,2022).

ASSESSING SEVERITY Classify patient:

Once a health care provider has determined that a child has measles, either by confirming that the signs and symptoms match the clinical case definition or by obtaining a positive result from a laboratory test, the next step is to evaluate

the child's level of illness in order to determine the appropriate course of treatment. You will gain knowledge of what questions to ASK the mother as well as what to LOOK/LISTEN/FEEL for in the child as you proceed through the next slides. As a consequence of this, you will be able to place children who have been diagnosed with measles into one of the following three categories: severe complicated measles, complicated measles, or uncomplicated measles (Hao et al .,2019).

Signs and symptoms of severe complicated measles (Hao et al .,2019) :

- Not able to drink or breastfeed
- Convulsions.
- Lethargic or unconscious.
- Deep or extensive mouth ulcers
- Chest indrawing and rapid breathing
- Stridor in a calm child
- Corneal clouding or ulcers, or vision affected
- Mastoiditis - pain and swelling of the bone behind the ear
- Severe malnutrition
- Severe dehydration

Common measles sequelae include pneumonia, diarrhoea, malnutrition, croup, ear infections, and eye problems related with vitamin A deficiency (xerophthalmia) are detailed along with their management and treatment. The described care and treatment are in accordance with World Health Organization recommendations.

The number of hospital beds dictates that the criteria for hospital admission will change from place to place. All children who have serious complications from measles should be hospitalised as soon as possible. These children are in grave danger unless they are admitted and receive medical attention immediately. If hospitalisation is not an option, the kid should get the finest outpatient care possible with regular checkups. Treatment for children with life-threatening symptoms must begin before they can be transported to the hospital.

HOSPITAL CARE OF SEVERE COMPLICATED MEASLES:

Safe arrival. Hospitalization is warranted for children with serious complications from measles (particularly those with danger symptoms). First and foremost, it is the responsibility of the health care provider working in the periphery to get the child to the emergency room as soon as possible in as good a condition as feasible. Meaning, therapy must begin immediately before the mother and kid are sent to the hospital (e.g. starting rehydration, giving the first dose of vitamin A or the first dose of antibiotic) (Vecchio et al.,2020).

Guidelines for effective administration. Managing all of the severe measles complications that need hospitalisation is impossible. In the following, we'll go over a few details that bear emphasis.

Pneumonia. The best way to provide antibiotics is via intramuscular or intravenous injection. Whenever possible, oxygen should be given to all children hospitalised with extremely acute pneumonia (cyanosis, unable to drink). Administer salbutamol if wheezing is an issue (Vecchio et al.,2020).

Croup. As a last resort, tracheostomy or intubation may be used to restore airflow. An alternative would be to use adrenaline in a nebulizer form. Chloramphenicol should be used if bacterial croup is suspected (Vecchio et al.,2020).

Isolation of children:

It is important to immunise your child against measles because it is a highly contagious disease that can spread quickly among unvaccinated youngsters. Children suspected of having measles who are feverish and have a rash should not be left alone in the lobby. Give them their own separate room if at all possible.

Children diagnosed with measles in a hospital setting should be kept in isolation for four days after the rash emerges. The number of people exposed to measles will be reduced. As much effort and money as can be spent on isolation should be spent on it. Patients diagnosed with measles should ideally be isolated in a separate area of the hospital.

Children who are malnourished or immunocompromised should be kept in isolation for the duration of their measles sickness, as they may shed the virus for a long period.

All children older than 6 months who need hospitalisation should be vaccinated against measles. If a child receives a dose before the age of 9 months, a booster dose should be administered as soon as feasible after the kid turns 9 months old (SITIP Measles Study Group,2019).

CLASSIFICATION OF DEHYDRATION:

Avoiding dehydration Good, awake, drinking normally, some tears, a wet lips and tongue, and a rapid recovery from a skin pinch.

Minor dehydration Any combination of the following two or more signs: anxious, agitated, and easily irritated; thirsty and drinking excessively; the skin pinching back slowly; eyes that have sunk inward.

Excruciating thirst At least two of the following symptoms are present: skin pinch recovers at a glacial pace weak or comatose, unable to drink well or at all, with hollowed-out eyes (Donade et al .,2021).

TREATING COMPLICATIONS:

1- DIARRHOEA

The symptoms of measles often include diarrhoea, which can lead to dehydration and secondary malnutrition. Dehydration should be evaluated and classified as illustrated on this slide before any treatment is administered.

Having three or more episodes of diarrhoea is the standard definition of the condition. Dehydration severity is evaluated and categorised using the criteria presented .

The youngster develops dysentery if there is blood in the stools. It is a bacterial infection that is the leading cause of dysentery (Shigella).

Diarrhea that lasts for 14 days or more indicates that the youngster has persistent diarrhoea. HIV infection should be considered in the differential diagnosis of a child with chronic diarrhoea and oral thrush.

Diarrhea is a common symptom of measles, and it can lead to dehydration and severe malnutrition if left untreated. Before administering any treatment, dehydration must be assessed and categorised (Ahmad.,2014) .

Treatment

- In cases of diarrhoea and dehydration in children, treatment should adhere to World Health Organization recommendations. Oral rehydration (with oral rehydration salts) and appropriate eating can treat mild dehydration in children, whereas intravenous fluids are necessary for those with severe dehydration. Using the World Health Organization's criteria, reevaluate the youngster and adjust treatment accordingly.
- Cotrimoxazole, or any oral antibiotic recommended for Shigella in your location, should be taken for five days to treat dysentery (See Annex C for dosage).
- Dietary changes are effective in the treatment of persistent diarrhoea. Increase the baby's breast milk consumption if you're still breastfeeding. It may be beneficial to resume nursing if you stopped doing so lately. We recommend substituting breast milk, a fermented milk product like yoghurt, or half the amount of animal milk with nutrient-rich semi-solid food if the child is currently receiving animal milk products(Ahmad.,2014).

2- eye problems

When a child suffers from night blindness, he or she has trouble seeing at low light levels, such as those present at night or in the early morning. Bitôt spots, also known as conjunctival plaques, are characterised by a foamy white appearance. Dehydration of the conjunctiva and cornea (xerosis), Corneal opacification and corneal erosion.

Treatment

Inject two separate doses of vitamin A into the kid on separate days. A third dose can be administered two to four weeks after the second. Apply tetracycline ophthalmic ointment three times daily for seven days. Use a protective eye pad; resting an eye pad over a closed eye aids in corneal healing. Tell the mom to come back in two days; if there's been no change, suggest she see an eye doctor(Turaiche,2022).

3- mouth ulcers

Herpes simplex virus and candida infections are the most common causes of mouth ulcers. Herpes ulcers begin as little blisters on the inside of the lips, the tongue, and the cheeks. In a short amount of time, they can transform into serious ulcers. Candida lesions in the mouth are often white and plaque-like. Having many infections in the mouth is a result of inadequate oral hygiene. Because of this, it's possible that the person will have trouble drinking and eating, which can lead to dehydration (from not drinking enough) and exacerbate malnutrition (from lack of eating). Even in the absence of measles, persistent and severe oral thrush should raise suspicions of HIV infection.

Treatment:

If the baby is able to take in liquids and solids, have the mother rinse the mouth out with clean water at least four times a day (with a pinch of salt in the water if any is on hand). Sores in the mouth can be treated by applying gentian violet at a concentration of 0.25 percent twice a day. In the absence of a suitable general anaesthetic, a local anesthetic/antiseptic solution containing lignocaine and tannic acid, or tannic acid and listerine, is recommended. Admit the child to the hospital and try to feed him or her through a nasogastric tube if the mouth sores prevent him or her from eating or drinking normally(Turaiche,2022).

Materials and Methods:**Study Design and Ethics:**

studied the characteristics and outcomes of measles infection in children younger than 18 using a retrospective cohort study. The patients' clinical and analytical data for Infectious Diseases and Pulmonology in Timisoara were analysed. Between January 1, 2019, and January 1, 2020, the patients were chosen. A population-based administrative database of inpatients during the study period was used to determine the sample size and critical characteristics. As part of our extensive database, we included patients' medical records, which were obtained legally and with their consent and hence were shielded from public view. Details on the patient's background, diagnosis, test results, and treatment were recorded. All patients' baseline characteristics and procedures were documented in the hospital database and in paper medical records verified by certified clinicians as part of the current enquiry. We found 136 cases of measles among the youngsters hospitalized here.

Patient Inclusion and Variables

Patients had to be under the age of 18 as the primary qualification for participation. Patients were also included if they had laboratory evidence of a measles infection or if they were admitted to the hospital while exhibiting symptoms of the disease. If patients did not provide adequate personal information or if their legal guardians did not give consent for the use of their medical records, they were not included in the study. Our data was divided by age into two groups for analysis: younger children and older teens. Patients above the age of 18 were not included in the study, however the United Nations (UN) convention defined an adolescent as a kid between the ages of 10 and 19.

Results:

Most children with measles also experienced fever, and this hyperpigmented rash is a highly accurate clinical diagnostic test for identifying measles infection. In light of this, a diagnosis should be made even before receiving confirmation from an anti-measles IgM serology test or an RT-PCR for measles virus RNA.

When looking at the course and severity of a measles infection, higher procalcitonin levels indicate that teenage patients are more likely to develop pneumonia and subsequent bacterial pneumonia. Even after controlling for age, no significant differences were seen in the overall incidence of illness complications, length of hospital stay, or number of patients admitted to the intensive care unit. Since the vast majority of our patients were not vaccinated, it is critical to remember that immunised children and adolescents would be predicted to have a less aggressive illness evolution (Krupka et al .,2022).

It was found, like with other illnesses in children, that a poor nutritional status was linked to worse outcomes and a longer hospital stay. Patients under the age of 15 who were diagnosed with measles and who subsequently got pneumonia were hospitalised for a considerably longer period of time (from 7 to 15 days, respectively) than the rest of the cohort. Although malnutrition in children should not be a concern in Romania, a total of 26 were found to have a suboptimal nutritional status, with a disproportionate number of Roma children affected. This contradicts the widespread belief that Romania is among the most developed countries in the world, with a very high Human Development Index (HDI). On the other hand, measles is associated with more severe health repercussions for children in developing nations like those in sub-Saharan Africa, where widespread immunosuppression due to starvation makes the disease more dangerous. The majority (43%) of children under the age of five in the Democratic Republic of the Congo were chronically malnourished, and 23% were acutely malnourished. Malnutrition has been linked to lowered cell-mediated immunity and, in less developed areas, a higher risk of morbidity and mortality in measles patients or an insufficient immunological response following vaccination. According to the literature, up to 3% of vaccinated individuals still get infected with measles, possibly due to a faulty immune response, even though two doses of the MMR vaccination confer a significant long-lasting immunity (López-Perea et al ,2021).

Several studies have estimated that the measles mortality rate for children in developing countries is anywhere from 5% to 25%, while in the United States, the overall mortality rate was only 1% and reached as high as 3% in hospitalised patients during the disease's final outbreak before it was eradicated. Measles-related deaths were found to be far lower in other European countries, at roughly 0.2% of all cases. However, due to the small sample size, no fatalities were reported in the current investigation.

In addition, the risk of blindness from keratitis-caused corneal ulcers is greatly increased in measles-infected newborns, especially those who are malnourished. No incidences of keratitis were found in our sample of children, however conjunctivitis affected 29.8% of them. A increased rate of blindness in malnourished patients with vitamin A deficiency has been found in various African studies and in a systematic evaluation of sequelae from measles. Most cases of childhood blindness in low-income countries are caused by measles, with estimates ranging from 15,000 to 60,000 annually. Corneal ulceration, keratomalacia, and permanent scarring or phthisis bulbi were shown to arise from measles in those with vitamin A deficiency. Any child hospitalised with measles in a developing country should be given a large oral dosage of vitamin A. Increased measles vaccine coverage to stop measles transmission and

programmes focusing on raising vitamin A in children are the most effective measures for reducing measles-related blindness (Manolescu,2022).

Consideration of the financial impact of extended treatment should be made during epidemics, as lengthy hospitalisations are often necessary due to disease complications. Although we did not assess hospitalisation costs, private healthcare systems are more likely to prioritise cost-effectiveness, as demonstrated by a study of measles patients who required hospitalisation. The CDC estimates that about one in every four cases of measles in the United States requires hospitalisation, and that one in every thousand cases results in death. With the help of vaccination campaigns, measles hospitalisations have declined dramatically, and the illness is now thought to be eradicated. Without vaccination, around 400,000 people would be hospitalised each year, costing more than \$3 billion, and over 1800 would lose their lives (Bogdan,2022).

Immunoglobulins are another therapy option for children and adolescents. When MMR vaccination is not possible after 72 hours of contact, current U.S. guidelines advise giving measles-specific immunoglobulins (IMIG) to infants and young children aged 6-11 months. In general, a dose of 0.5 mL/kg up to a maximum of 15 mL is suggested. Contacts with immunosuppression should receive IVIG unless they are already receiving adequate IVIG or SCIG for their condition. Women who are not immune throughout pregnancy may also benefit from IVIG. Priority should be given to contacts with close and extended exposure, and the suggested dosage of IVIG is 400 mg/kg, taking into account that IMIG may be used for subsequent non-immune contacts within six days of exposure, and that MMR is indicated if supplied within 72 h after exposure (López-Perea et al ,2021).

Limitations and Future Perspectives:

This study synthesises key information on measles's clinical and paraclinical symptoms in the unvaccinated juvenile population, shedding light on the disease's epidemiology. As a result, there are a number of issues that need fixing. As a first issue, the study's statistical strength was compromised by its small sample size. Many absent patient paper records further reduced the sample size. Second, as this study is retrospective in nature, it is dependent on the quality of patient recordkeeping and the precision of digital data transcription from paper records. Considering there are a disproportionately high number of Roma children diagnosed with measles, it is crucially vital to compare and contrast this population with the Romanian patient population. Last but not least, because to the retrospective nature of the study, the research team could not use a standardised checklist to evaluate the infected individuals. This meant that numerous patients with missing data had to be left out of the equation.

Conclusions:

People who contract measles often develop a potentially fatal lung infection called measles pneumonia. An noteworthy worry among patients is that the great majority of hospitalised children with measles were unvaccinated. almost 40 percent of these inpatients identified as belonging to this community. Pneumonia was a serious complication for these individuals and should be prevented by paying close attention to risk variables such age, poor nutrition, Roma ethnicity, anaemia, and procalcitonin levels. Many effective treatments exist for pneumonia, but prevention is still the best medicine. When parents express hesitation about getting their children vaccinated, doctors should take the time to listen and address any questions or concerns they may have, especially in the Roma population, which has the lowest vaccination rate, since this is a great opportunity to educate parents and move toward total eradication via vaccination.

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