Correlation between Vitamin A Deficiency and the Severity of Mycoplasma Pneumoniae Pneumonia in Children

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Mycoplasma pneumoniae pneumonia is a problem that has attracted the attention of children's respiratory department in recent years. The relationship between vitamin A deficiency (VA) and the severity of Mycoplasma disease (MPP) in children was studied. In this paper, the hospitalized children with Mycoplasma pneumoniae pneumonia (MPP) in our hospital were selected as the research objects, and they were divided into common type and refractory type (RMPP) for comparative experiment. The VA and immunoglobulin levels of the two groups were compared. Attention should be paid to the normal ratio of VA deficiency (CVAD) and sub deficiency (svad) in the two groups. In this paper, the relationship between infection, immunoglobulin level and VA level was analyzed. The results showed that CVAD was 27.27% in MPP group and 63.75% in RMPP group. Comparison of immunoglobulin levels between the two groups: the levels of IgM, IgA and IgG in the normal MPP group were significantly lower than those in the RMPP group. On the other hand, the detection rate of CVAD was 81.48% in RMPP with infection and 54.72% in RMPP without infection. The detection rate of CVAD in patients with infection was significantly higher than that in patients without infection. There was a correlation between VA deficiency and MPP classification.

Keywords: Vitamin A Deficiency, Mycoplasma Pneumoniae Pneumonia, Immunoglobulin Level, Condition Correlation
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Mycoplasma pneumoniae pneumonia is a common pulmonary infection disease in pediatric clinic. Children are vulnerable to Mycoplasma pneumoniae lung infection due to their weak immunity during development. Among them, severe Mycoplasma pneumoniae infection has great influence on lung structure and lung function. Mycoplasma pneumoniae is an important disease-causing pneumonia in children in community. Clinical studies have shown that the serum vitamin a level of children under 5 years old with community-acquired pneumonia is low in neonatal period. Vitamin A, known as anti-infective vitamin, plays an important role in innate immunity and adaptive immunity, and is closely related to the recovery of respiratory tract infection. After birth, VA participates in the formation and development of innate immune system and adaptive immune system. As VA deficiency is the main cause of morbidity and mortality of infectious diseases in children, the role of VA in the prevention and treatment of infection has attracted much attention. To analyze the correlation between vitamin A deficiency and the severity of Mycoplasma pneumoniae pneumonia in children is helpful to the treatment of the disease.

Lee conducted a study on the role of serum Mycoplasma pneumoniae IgA, IgM and IgG in the diagnosis of Mycoplasma pneumoniae associated

pneumonia in school-age children and adolescents. The purpose of this study was to investigate the clinical diagnostic value of anti Mycoplasmapneumoniae immunoglobulin in school-age children and adolescents with Mycoplasma pneumoniae associated pneumonia. Lee recruited 80 cases of children with Mycoplasma pneumoniaeIgM positive or Mycoplasma pneumoniae immunoglobulin G (IgG) increased four times. The clinical characteristics and laboratory tests of IgA, IgM and IgG of Mycoplasma pneumoniae, C-reactive protein and liver enzymes in blood were analyzed. Lee's research indicators are more comprehensive, but the experimental means are more complex, easy to bring errors [1]. Koekkoek studied the effect of vitamin A, summarized the antioxidant mechanism and antioxidant status of critically ill patients, as well as the supplement effect of vitamin A, C and E, and coenzyme trace elements selenium and zinc in critically ill patients, and affirmed the role of vitamin A in improving immunity. However, according to the theory, it is lack of experimental proof [2]. Zi Mei studied the diagnostic value of serum cytokines in children with mycoplasma pneumonia. Zi Mei used the method of control experiment to study. 50 children with Mycoplasma pneumoniae pneumonia were selected as the observation group and 30 healthy children as the control group. The levels of serum IL-6, IL-8, IL-10 and TNF - α in the observation group before and after treatment were observed by ELISA. However, if the sample size is too small, it may lead to accidental error [3]. Li studied Th1 / Th2 cytokine profile and its diagnostic value in children with Mycoplasma pneumoniae pneumonia. Li detected Mycoplasma pneumoniae in children with single infection and healthy children by cytokine assay, and detected Mycoplasma pneumoniae in children with pneumonia by real-time PCR. During the study, Li detected cytokines in 526 children with pneumonia and 30 healthy children with Mycoplasma pneumoniae infection. In the study of Li, there are many experimental samples, but the method is relatively cumbersome, and the stability is low, so it has little significance for medical practice [4].

In this paper, 300 cases of hospitalized children with Mycoplasma pneumoniae pneumonia (MPP) were divided into two groups, 220 cases in MPP group and 80 cases in RMPP group. The levels of VA and immunoglobulin were compared between the two groups. The detection of clinical VA deficiency (CVAD), subclinical VA deficiency (svad) + normal VA was observed. The relationship between infection and immunoglobulin in children with VA and RMPP deficiency was analyzed.

MYCOPLASMA PNEUMONIAE PNEUMONIA AND VITAMIN A

Clinical Symptoms and Pathogenesis of Mycoplasma Pneumoniae Pneumonia

Clinical symptoms

Mycoplasma pneumonia is prevalent every three to four years. It is a common seasonal epidemic, with a long fever time, a long time of onset, rapid development of the disease, more clinical events and so on. Mycoplasma pneumoniae infection seriously affects the life, health and daily life of patients. The injury mainly involved the airway and lung. The severity of symptoms varies, such as fever, cough, shortness of breath, headache, chills, or a low or even no fever. Most patients have a dry cough at first, followed by stool, and occasionally nausea, vomiting and anorexia. Breathing is usually not difficult, but infants may experience wheezing and shortness of breath. Severe cases may appear anorexia, subcutaneous effusion, lung tumor, necrotizing pneumonia, etc. Some patients develop rapidly and may develop into acute respiratory distress syndrome (ARDS) and even die. The average mortality rate is as high as 50%.

Although the symptoms of mycoplasma pneumonia patients are serious, the chest examination generally does not appear abnormal symptoms, usually mild nasal congestion, as well as nasal effusion and moderate pharynx. The tympanic membrane is often saturated. About 15% of people have tympanic membrane. Cervical lymph nodes can be enlarged. A small amount of subcutaneous effusion occurs in about 10% to 15% of cases. In addition to respiratory function, mycoplasma pneumonia may be accompanied by multiple injuries of the system and multiple organs. Skin damage can occur as ovarian rash, erythema, and

blisters and so on. Vomiting, diarrhea and liver damage may occur in the gastrointestinal system. Blood system failure is more common in hemolytic anemia. Central nervous system damage can be seen in multiple meningitis and brain injury [5]. Sometimes the cardiovascular diseases include myocarditis and pericarditis.

Pathogenesis

MP, the main pathogen of MPP, widely exists in nature. It is the smallest microorganism known to survive independently. It contains DNA and RNA and has no cell wall structure. Further study of its pathogenesis revealed that the proportion of T cells in children was unbalanced and abnormal expression was found. Generally speaking, the greater the excretion of inflammatory mediators, the stronger the immune response of the body, the more likely it is to develop into severe mycoplasma pneumonia. At present, there is more evidence that immune disorder is related to the occurrence and development of MPP. With the increase of MP resistance to macrolide antibiotics, the use of tetracycline and quinolones in children increases the difficulty of treating MPP. Mycoplasma pneumoniae infection can cause damage and displacement of airway epithelium, resulting in decreased airway clearance rate. Activation of Toll receptor can increase the expression of vinin in respiratory tract epithelium, and increase the expression of lung epithelial cells. Due to Venice function excess in trachea, it leads to high mucus secretion [6]. A large amount of tracheal secretion is a good medium for a variety of pathogenic microorganisms, which further aggravates the disease. Coagulation function is directly damaged, resulting in excessive immune response, leading to high blood pressure, prone to thromboembolism.

Treatment of Mycoplasma Pneumoniae Pneumonia

Antibiotics

Macrolide drugs are recognized as the first choice of drugs for the treatment of PMR, including internal and external, including erythromycin and azithromycin. Azithromycin is the main drug in clinical application. In recent years, with the increase of drug resistance, the efficacy of azithromycin alone has been significantly weakened, and other antibiotics and hormones should be used in combination. If the clinical symptoms of MPP patients still have no improvement after taking macrolide antibiotics for 48-72 hours, tetracyclines and fluoroquinolones can be used. Tetracyclines and fluoroquinolones are effective against fungal infections, but they are only used in adolescents with mature bones due to their obvious adverse effects on cartilage development in children. Tetracycline, such as dimethylaminotetracycline, may affect the development of malt in young children, so it is recommended to take it for children under 8 years old [7]. At present, there are few reports on the clinical application of these two kinds of drugs in China, and the effect of azithromycin cannot be ignored. Azithromycin has ideal permeability, high concentration distribution in infected tissues and cells, and good anti-inflammatory and immunosuppressive effects. Therefore, it is considered to be the first choice for the treatment of MPP in children.

Glucocorticoid

Glucocorticoids have strong anti-inflammatory and immunosuppressive effects, but the side effects should not be ignored. At this stage, there are still problems in the dose, time and course of glucocorticoids given to MPP children. In clinical practice, the amount of hormone can not only be determined according to the severity of inflammatory reaction, but should be determined in combination with children's symptoms, and individual treatment plans should be implemented [8]. In the timing of treatment, we should reduce the risk of bronchitis as soon as possible, and improve the predictive ability. Long term use of high-dose hormone may lead to immunosuppression and other serious complications. Therefore, it is suggested that children with MPP should receive short-term high-dose hormone therapy early and gradually reduce the dose. For children with severe disease or hemorrhagic infiltration above the lung, glucocorticoid should be actively used in the initial stage, and the dosage and treatment course should

be mainly based on protein discovery and C-response.

Immunoglobulin

Immunoglobulin combined with azithromycin can effectively improve the clinical efficacy. Previous studies have shown that globulin gamma mainly realizes the immune regulation of MPP through the following mechanisms: F (ah) 2 pathways inhibits cell apoptosis; restricts the role of FC to stop cellular immunity and autoantibody production; improves the killing function of natural killer cells; and inhibits immune injury caused by complement [9]. However, the application of globulin -γ in children with MPP is relatively less, and its therapeutic effect is still lack of accurate clinical data support, which needs further observation, investigation and summary.

Combination of Chinese and Western Medicine

At present, the clinical treatment of MPP mostly uses macrolide drugs, the curative effect is affirmative. However, macrolide drugs have gastrointestinal irritation symptoms, liver toxicity to a certain extent, and drug resistance is becoming more and more serious. The advantages of traditional Chinese medicine in the treatment of MPP are gradually emerging. Studies have shown that traditional Chinese medicine has a certain inhibitory effect on MP, specifically in regulating immune function and improving circulation, which can reduce drug resistance and prevent recurrence. Macrolide antibiotics cannot completely replace antibiotics, but can significantly reduce the disease progression rate, improve symptoms and improve children's immunity. External therapy of traditional Chinese medicine is more and more recognized by children and parents for its low price, simple operation, safety, convenience and other advantages. Traditional Chinese medicine has put forward heat treatment, flame elimination, heat clearing and detoxification, blood circulation and hemostasis, strengthening body and eliminating pathogenic factors. Studies have confirmed that the combination of traditional Chinese and Western medicine treatment is more effective than simple western medicine treatment. Syndrome differentiation can not only reduce the progress of the disease, improve symptoms, but also enhance the body's resistance and reduce the negative impact of antibiotics. The combination of syndrome differentiation and disease differentiation, supplemented by the combination of traditional Chinese and Western medicine, can better promote the rehabilitation of patients with obvious advantages.

Effect of Vitamin A

VA deficiency is one of the three major micronutrient deficiencies in the world. Each year, VA deficiency causes 1-2 million deaths worldwide. Every year, about 200000 children aged 0-4 die from vitamin A deficiency. Half a million school-age children are blind due to VA deficiency. At present, with the rapid development of national economy and the improvement of people's living standards, clinical VA deficiency is rare, but subclinical VA deficiency is still very common.

Visual function

Vitamin A was previously recognized to be involved in maintaining the dark photoreceptors of optical cells. The cells in the retina are rod-shaped and contain rhodopsin, which is bound to opsin by 11 CIS retinoic aldehyde. After exposure to light, photoelectric signals are generated, and then through a series of redox reactions, the newly produced substances are transported to the retina and begin a complex isomerization process with trans retinol in plasma to maintain dark light perception.

Keep skin and mucous membrane intact

Vitamin A is a coenzyme that regulates the composition of glycoproteins. It can stabilize epithelial cell membrane and maintain the integrity and function of epithelial cells. The effect of vitamin A on tissue function and integrity is achieved by regulating the information exchange between adjacent cells. Vitamin A deficiency may lead to epithelial dryness, and normal epithelial cells may transform into lamellar squamous cells, leading to cell keratinization.

Nuclear hormone

Vitamin A regulates the activation and expression of nuclear RNA messenger through retinoic acid receptor. The core is retinoic acid receptor, including three retinoic acid receptors rara, B and C and three cis isomers of retinoic acid X receptor rxra, B and C. The most important function of retinoic acid receptor is to regulate cell division and differentiation. The results of this regulation may affect all aspects of the body, such as development, reproductive function, immune function, hematopoietic function and so on.

Maintain and promote immune function

When foreign pathogens invade the human body, nonspecific immunity plays an important role. VA may affect the physical barrier of nonspecific immunity, the secretion of sIgA and the function of innate immune cells, and participate in the nonspecific immunity of the body and reduce the risk of infectious diseases. VA may also affect two major immune cells, which are specifically immune. Retinoic acid is essential for maintaining immune function, which is based on cell differentiation and proliferation induced by immune stimulation. Retinoic acid regulates target genes through nuclear receptors, thus improving cellular immune function, promoting immune cells to produce antibodies, and promoting T lymphocytes to produce specific lymphocytes [10]. Retinoic acid is very important for maintaining sufficient levels of natural killer cells in the blood, and has antiviral and anticancer activities. When vitamin A is insufficient, the expression of retinoic acid receptor in immune cells will be reduced accordingly, which will affect the immune function of the body. Children with vitamin A deficiency and borderline deficiency are at increased risk of infectious diseases and death.

Reproductive development and maintenance

Reproductive tissues and mammalian embryogenesis depend on rar for gene regulation. Vitamin A plays an important role in these tissues. These effects are also achieved through the regulation of cell proliferation and differentiation, especially in endochondralosteogenesis. When vitamin A deficiency occurs, the formation of long bones and the development of teeth are impaired; in men, testicular atrophy, sperm quantity and motility decrease.

Treatment of vitamin D activity and its effect on bone metabolism

At present, many studies have shown that vitamin A is closely related to bone metabolism. Vitamin A deficiency may lead to a decrease in the number of bone cells, loss of control of bone cell function, and excessive proliferation of periosteum and bone cavity. The adverse effects of excessive vitamin A on bone mineralization and structural integrity have recently become a concern. Excessive vitamin A may stimulate bone resorption and inhibit bone remodeling. This effect may be related to the protection of calcium in chronic vitamin A poisoning.

Cell proliferation effect

In addition to affecting normal health-related evolutionary functions, vitamin A also plays a regulatory role in correcting various pathological conditions. Vitamin A and its isomers can promote the final differentiation, inhibit proliferation and promote degradation, which play a certain role in the malignant degree of tissues. In vitro studies on a variety of tumor cell lines show that high-dose retinoic acid has anticancer potential.

Promote hemoglobin production and increase iron intake in food

Vitamin A intervention experiment can increase the number of blood cells and cells in patients with anemia. Vitamin A and protovitamin a can improve iron absorption by preventing the interference of plant acids. Studies have shown that the effect of vitamin a nutritional status on the blood system is not only the direct effect of vitamin A in diet on iron absorption, but also has a certain regulatory effect on iron nutritional status, including stimulating blood cells and promoting iron into red blood cell lines. Vitamin A status not only affects the proliferation of blood cell lines in bone marrow, but also affects the formation of platelets and thrombosis.

VA Deficiency and Infectious Diseases

VA deficiency and measles

Measles is a highly infectious disease of children caused by measles virus. It still poses a serious threat to the health of children in economically underdeveloped areas. Who recommends two consecutive doses of VA from high-dose oral administration to reduce complications. Measles virus can lead to blindness by reducing the level of serum VA, because lack of VA can lead to corneal dryness, which can damage the integrity of the cornea.

VA weakness and hand foot mouth disease

Hand foot mouth disease (HFMD) is an acute infectious disease caused by intestinal flora, which is more common in children under 5 years old. Relevant research results show that in children with hand foot mouth disease, low level of VA may affect children's innate immunity, while reducing the level of specific antibodies that play a role in adaptive immunity, thus affecting children's immunity to HFMD [11].

VA deficiency and recurrent respiratory tract infection

Recurrent respiratory tract infection is a common infectious disease in pediatrics. The lack of VA will lead to the reduction of mucin synthesis, which will affect the integrity of respiratory epithelial cells and the composition of immunoglobulin, leading to repeated respiratory tract infections [12]. VA deficiency is one of the important factors of acute infectious diseases in children.

VA and norovirus

Norovirus enteritis is one of the main pathogens causing acute infectious diarrhea in children. VA can inhibit norovirus in vivo and in vitro. Retinoic acid, an oxidative metabolite of vitamin A, can reduce the persistence of norovirus infection [13]. Vitamin A can maintain the integrity of intestinal epithelial cells, strengthen the immune function, prevent the reproduction of norovirus, and play the role of antiviral signal transmission.

VA insufficiency and viral encephalitis

Viral encephalitis is an intracranial infectious disease caused by a variety of viruses. The plasma VA level in acute phase of viral encephalitis was significantly lower than that in normal control group. Anti-infection and immunosuppression can affect the blood VA level in patients with viral encephalitis.

EXPERIMENTAL DESIGN OF VITAMIN A DEFICIENCY AND SEVERITY OF MYCOPLASMA PNEUMONIAE PNEUMONIA IN CHILDREN

Research Object

In this paper, 300 cases of Mycoplasma pneumoniae (MPP) children diagnosed in our hospital from March 2017 to October 2019 were selected as the research objects and approved by the hospital medical ethics committee. According to the severity of the disease, they were divided into two groups: MPP group (220 cases) and refractory RMPP group (80 cases). There were 90 males and 22 females, aged 2-12 years, with an average age of (7.32 ± 2.76) years. The course of disease was 5-30 days, with an average of (17.83 ± 0.82) days. There were 42 males and 38 females in RMPP group, aged from 1 to 10 years, with an average of (6.83 ± 2.99) years. The course of disease was 7-30 days, with an average of (18.34 ± 3.21) days. There was no significant difference in general information between the two groups ($P > 0.05$).

Inclusion and Exclusion Criteria

Inclusion criteria

1) The diagnostic criteria of pulmonary infection in children were in accordance with the relevant provisions of "diagnostic criteria for hospital infection" and confirmed.

2) The age of the children ranged from 3 to 12 years old.

3) The children had obvious clinical symptoms, such as chest signs change and persistent cough.

Among them, the commonly used diagnostic criteria for MPP were as follows: in accordance with the relevant diagnostic criteria in Practical Pediatrics of zhufutang (7th Edition), MP IgM serum antibody test results were positive. Throat swab real-time PCR fluorescence quantitative detection of

Mycoplasma pneumoniae nucleic acid positive, chest X-ray showed abnormal.

Diagnostic criteria of RMPP: MPP had been treated with macrolide for 7 days, with persistent fever and aggravation of chest manifestations or clinical symptoms.

4) Children and their families were informed of the study and signed informed consent.

(2) Exclusion criteria:

1) The child was diagnosed with refractory Mycoplasma pneumoniae pneumonia infection.

2) The child had cough, asthma or allergic rhinitis before.

3) The child had bacterial bronchitis.

The study was reviewed and approved by the hospital ethics committee.

Experimental Design

Experimental methods

After hospitalization, all the children were given systematic examination, and venous blood was collected for routine blood examination. The children will receive liver function, renal function, various vital signs and chest X-ray examination. On the second day of admission, 2ml of non-antithrombin blood was collected, and the serum was separated and placed in the refrigerator at -20 °C within 24 hours to avoid light detection. The level of VA was determined by HPLC with Agilent 1200 / chromatographic column. The drugs containing vitamin A were fasted for 1 day before sampling. At the same time, the levels of IgA, IgG and IgM were measured by using HITACHI 7600-020 automatic chemical analyzer.

The normal reference values of IgA, IgG and IgM were as follows IgA:0.70-3.30g/L, IgG:8.00-16.00g/L, IgM:0.5-2.5g/L. Diagnosis of vitamin A deficiency: VA < 0.2mg/l is clinical vitamin A deficiency (CVAD), 0.2-0.3mg/l is subclinical vitamin A deficiency (svad), and 0.3-0.7mg/l is normal VA.

Observation index

VA level, VA deficiency and immunoglobulin levels were compared between the two groups. The relationship between VA deficiency and infection was analyzed, and the relationship between VA deficiency and immunoglobulin level in RMPP children was observed.

Data processing

Spss22.0 statistical software was used to process the data. The measurement data were expressed as mean ± standard deviation and t-test; the count data were expressed as rate (%) by chi square test. $P < 0.05$ means the difference is statistically significant.

The single population t-test formula is as follows:

$$t = \frac{\bar{X}-\mu}{\frac{\sigma_X}{\sqrt{n-1}}} \qquad (1)$$

Where n is the sample size and $\overline{X}$ is the average number of samples.

The formula of double population t test is as follows:

$$t = \frac{\bar{X}_1-\bar{X}_2}{\sqrt{\frac{\sigma_{X_1}^2+\sigma_{X_2}^2-2\gamma\sigma_{X_1}\sigma_{X_2}}{n-1}}} \qquad (2)$$

Where $\overline{X}_1, \overline{X}_2$ are the average number of two samples respectively, and γ is the correlation coefficient of related samples?

The χ2 test formula was as follows:

$$X^2 = \Sigma\frac{(A-E)^2}{E} = \Sigma_{i=1}^{k}\frac{(A_i^2-np_i)^2}{np_i}, (i = 1,2,3,\dots,k) \qquad (3)$$

Ai is the observation frequency of i level, n is the total frequency, and Pi is the expected frequency of I level. When the N ratio is large, the chi square distribution of k-1 (the number of parameters used to calculate Ei) is approximately followed by the chi square distribution.

CORRELATION BETWEEN VITAMIN A DEFICIENCY AND THE SEVERITY OF MYCOPLASMA PNEUMONIAE PNEUMONIA IN CHILDREN

VA Comparison Results

VA deficiency was compared between the two groups. The results are shown in Table 1 and Figure 1.

Table 1.
Comparison of VA deficiency between the two groups n (%)

Group	Number	CVAD	SVAD+VA normal
MPP	220	61 (27.27)	159 (72.73)
RMPP	80	50 (63.75)	30 (36.25)
χ^2		33.488	
P		<0.001	

Figure 1.
Comparison of VA deficiency between the two groups n (%)

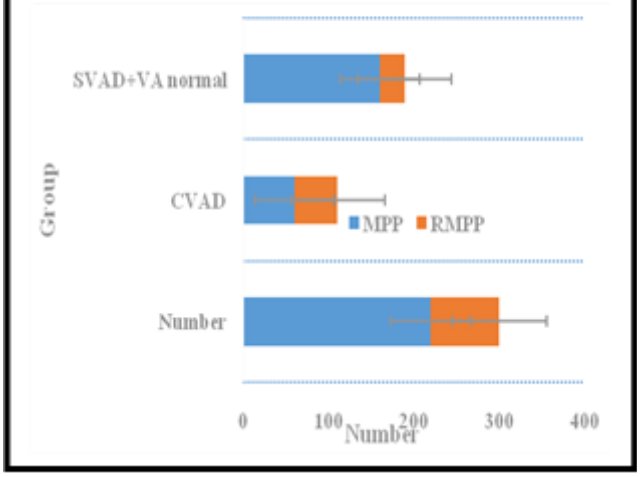
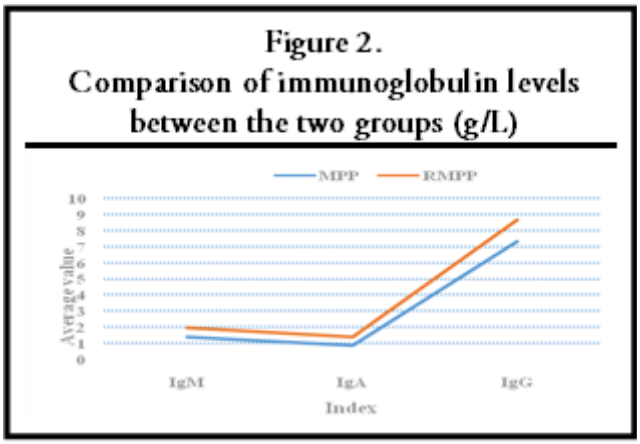


Figure 2.
Comparison of immunoglobulin levels between the two groups (g/L)



It can be seen from Table 1 and Figure 1 that the VA level of MPP group was (0.24 ± 0.09) mmol/L, and that of rmpp group was (0.19 ± 0.19) mmol / L, and the difference was statistically significant (t = 7202, P = 0.000). The detection rate of CVAD in normal MPP group was significantly lower than that in rmpp group (P < 0.05).

In addition, in the general MPP group, there were 60 cases of clinical VC deficiency, accounting for 27.27%, and 160 cases of subclinical VA deficiency and normal, accounting for 72.73%. In RMPP group, 51 cases (63.75%) had clinical VC deficiency, 29 cases (36.25%) were subclinical deficiency and normal VA. The difference was statistically significant.

Comparison Results of Immunoglobulin Levels

The comparison results of immunoglobulin levels between the two groups are shown in Table 2 and Figure 2.

Table 2.
Comparison of immunoglobulin levels between the two groups (g/L)

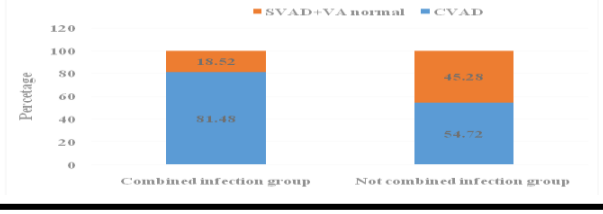
Group	IgM	IgA	IgG
MPP	1.42±0.22	0.87±0.10	7.31±1.32
RMPP	1.98±0.28	1.38±0.15	8.69±1.69
t	17.432	34.158	7.234
P	<0.001	<0.001	<0.001

According to Table 2 and Figure 2, the levels of IgM, IgA and IgG in the ordinary MPP group were significantly lower than those in the RMPP group (P < 0.05). The contents of IgM, IgA and IgG in MPP group were 1.42 ± 0.22 g / L, 0.87 ± 0.10 g / L and 7.31 ± 1.32 g / L, respectively. The contents of IgM, IgA and IgG in RMPP group were 1.98 ± 0.28 g / L, 1.38 ± 0.15 g / L and 8.69 ± 1.69 g / L, respectively. T test met the requirements (P < 0.001). The levels of IgM, IgA and IgG in MPP group were significantly lower than those in RMPP group, indicating that IgM, IgA and IgG can indicate the severity of the disease.

Relationship between VA Deficiency and RMPP Co Infection

By analyzing the relationship between VA deficiency and RMPP co infection, the results of the relationship between VA deficiency and RMPP co

Figure 3.
The relationship between VA deficiency and co-infection in children with RMPP n (%)



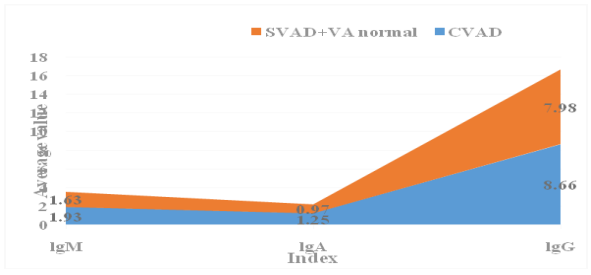
infection are shown in Figure 3.

According to Figure 3, there were 27 cases of RMPP combined with infection, accounting for 33.75%, and 53 cases without infection, accounting for 66.25%. The detection rate of CVAD in RMPP combined infection group was 81.48%, and that in RMPP uninfected group was 54.72%. The detection rate of CVAD in RMPP combined infection group was significantly higher than that in RMPP non infection group. On the other hand, the p value in the experiment was 0.017, less than 0.05, indicating that the difference was statistically significant. The proportion of VA deficiency symptoms in the infection group was significantly increased.

Relationship between VA Deficiency and Immunoglobulin Level of RMPP

By analyzing the relationship between VA deficiency and immunoglobulin level of RMPP, the relationship between VA deficiency and immunoglobulin level of RMPP children is shown in Figure 4.

Figure 4.
The relationship between VA deficiency and immunoglobulin levels in children with RMP



According to Figure 4, the levels of IgM and IgA in CVAD group were significantly higher than those in svad + VA normal group ($P < 0.05$). Among them, the p value of each group was less than 0.001, the difference was statistically significant. The levels of IgM, IgA and IgG in CVAD group were significantly higher than those in svad + VA normal group, which indicated that the immune system reaction was severe and the condition was serious.

CONCLUSIONS

Vitamin A is a fat-soluble vitamin that must be taken from food. It is involved in maintaining the normal activities of the body and regulating the immune function of the body. Children as a special group, due to the immature digestive function, there are problems such as unreasonable nutrition and unbalanced nutrition. They often suffer from VA deficiency, which affects the body immunity and is prone to various diseases. MPP is a typical disease. The relationship between vitamin A deficiency and the severity of Mycoplasma pneumoniae pneumonia in children was analyzed.

This study showed that the VA level of normal MPP group was significantly higher than that of RMPP group, and the detection rate of CVAD was significantly lower than that of control group. RMPP confirmed that VA deficiency was related to the severity of MPP. Both VA deficiency and MPP can damage the function of epithelial cells. Therefore, it is suggested that VA deficiency may be related to MPP. The lower the VA level, the more likely to have serious disease. When CVAD is present in vivo, the risk of MPP will be significantly increased. CVAD may lead to the decrease of immunity and the resistance to local airway diseases and uncontrollable infections, which may lead to the deterioration of MPP to RMPP. When the human body is lack of VA, once polluted, it will lead to local airway inflammatory cells overload, which will cause excessive inflammatory reaction like waterfall.

This study showed that the levels of IgM, IgA and IgG in the common MPP group were significantly lower than those in the RMPP group, while the IgM and IgA levels in the CVAD group were significantly higher than those in the svad + VA normal group, which confirmed that VA deficiency had a certain impact on the immune function of MPP children. Immunoglobulin is synthesized by B lymphocytes. After stimulated by antigen, B lymphocytes differentiate and proliferate under the action of CD4 + T lymphocytes to synthesize and secrete immunoglobulin. This study found that VA deficiency affected the severity of MPP and immune function. VA is a synthetic glycoprotein carrier, glycoprotein is the key structural material of cells, especially epithelial cells. Once glycoprotein is deficient, it will affect children's eyes, respiratory tract, digestive tract, urinary tract and reproductive

organs. In conclusion, the severity of MPP is closely related to the severity of mpva. VA supplementation may be beneficial to the prevention and treatment of MPP, and its specific mechanism needs to be further studied in the future.

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