Journal Educational of Nursing (JEN)
Vol. 6 No. 2 – July – December 2023; page 112-118
p-ISSN: 2655-2418; e-ISSN: 2655-7630
journal homepage: https://ejournal.akperrspadjakarta.ac.id
DOI : 10.37430/jen.v6i2.174

Article history:
Received: May 28th, 2023
Revised: June 12th, 2023
Accepted: July 30th, 2023

Application of Chest and Infra Red Physiotherapy on Breathway Cleaning in Toddler Age 0-24 Months with Common Cold

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Coughs and colds are upper respiratory tract infections (ARI) which often occur in children under 5 years and can occur 6-9 times a year. Symptoms of a cold cough are excessive mucus production which makes it difficult for children to breathe because toddlers cannot produce their own secretions so it can cause breathing problems andfeel restless so need to be given chest physiotherapy and infrared intervention. The aim of this research is to find outeffectivenessfrom the application of physiotherapy and infrared to clear the airway in toddlers 0-24 months with coughs and colds. This research methodusedescriptive method with a case study approach with research subjects of 5 toddler respondents aged 0-24 months with inclusion criteria. The instruments used include observation sheets and Borg score assessments. The results of this study were that it was able to overcome airway clearance in the respondent's condition after being given intervention twice a day with a duration of 50 minutes for 3 days with sputum output of (60%) and no sputum output of (40%), a decrease in frequency.Respiratory, decreased Borg score, no shortness of breath and baby sleeps more soundly.Conclusion: the application of chest physiotherapy and infrared is effective in overcoming airway clearance problems in toddlers aged 0-24 months with coughs and colds.

Keywords: Chest Physiotherapy; Infrared, Airway Clearance; Common

Introduction

Babies are children aged 0 to 12 months, experiencing stages of growth and development in the golden period until the age of 24 months. Causes of morbidity and number death (mortality) in infants, especially those caused by microorganisms,bacteria, viruses or fungi. One disease that often occurs in babies iscommoncold. Common Cold is a primary infection that occurs in the nasopharynx and nose due to the rhinovirus type virus, influenza viruses, entero virus and parainfluenza, adenovirus[1].

Common colds or coughs and colds include upper respiratory tract infections (ARI) which often occur in children under 5 years of age which can occur 6-9 times a year, this proves that babies and toddlers are very susceptible to coughs and colds because of their immunity.onthe baby is still in the low category[2].

Based on Who (2020) incident data common Cold in developing countries is the leading cause of under-five deaths, around 41 per 1000 live births. Based on health research data (Riskesdas) in 2018 mentioned prevalence incident number common cold in Indonesia is around 25.0% and 13.8% or 1,017,290 cases that have been discovered and diagnosed by health workers (doctors, nurses, midwives)[3].

In age group prevalence The incidence of common cold that occurs in babies

aged 0-11 months is 7.4% of those aged 1-4 years with prevalence highest which is about 8.5.Prevalence according to the diagnosis of health workers at the age of 0-11 months, namely 9.4% and at the age of 1-4 years, namely 13.7%[4]. Based on data from the Banyumas district health service in 2022, there were 37,236 cases of children under 5 years old who had coughs that were not pneumonia.[5].

Cause of death of affected toddlers common Cold is mostly caused by viruses and bacteria. Apart from that, there are several factors risk which can increase the severity of symptoms common cold includes nutritional status, vitamin A supplementation, premature babies, immunization, supplementation zinc, unclean environment, parental knowledge, social status and parental education, exclusive breastfeeding[6]

Symptom common A mild cold in babies is indicated by a cough lasting less than 2 weeks, a blocked nose, difficulty breathing, sometimes accompanied by fever. If the child's immunity is good, it will not cause a high fever[7]. Another symptom is that the nose produces secretions that are initially liquid and can become thick and smelly if there is a secondary infection by cocci. Thick secretions make it very difficult for children to breathe because toddlers cannot yet expel the secretions themselves, which can cause breathing problems and make them feel restless[8].

Airway clearance is an abnormal respiratory condition due to the inability to cough or expel secretions normally. Ineffectiveness airway clearance is someone who is unable or has difficulty breathing due to a blockage in the respiratory tract in the form of phlegm or sputum which causes respiratory ventilation to be obstructed[9].

Methods that can be used to improve the airway in children common cold, namely pharmacological therapy and non-therapypharmacology. Pharmacological therapy is the administration of drugs by health workers after a diagnosis has been determined by administering drugs such asantibioticsand antipyretic therapy, mucolytics,expectorantand nebulizer therapy. Non-pharmacological therapies that can be given include massage therapy, herbal therapy steam inhalation, physiotherapy including infrared and chest physiotherapy (deep breathing, postural drainage, clapping, vibration) and effective coughing which is useful for reducing shortness of breath due to blockage of sputum or phlegm in the lungs. -lungs so it can expedite breathing[10]

Research conducted by Ningrum (2019) proves that there is an influence of the application of physiotherapy on the ineffectiveness of airway clearance in bronchitis patients who have a respiratory frequency within normal limits, and are able to expel sputum.[11].

Research from Maidartati (2014) proves that children aged 1-5 years with impaired airway clearance in Community Health Centers Moch. Ramdan Bandung experienced significant changes in the average respiratory frequency after being given chest physiotherapy. The chest frequency before being given therapy, the respiratory frequency reached 45 times/minute and after being given therapy it became 41 times/minute. This shows that the respiratory frequency decreases and breathing is stable[12].

Methods

StudyThis research method uses a descriptive research method with a case study research approach. The population in the study were all babies aged 0-24 months who had complaints of coughs and colds at Dr. Clinic. Dewi Astuti Wangon in September 2023 as many as 20 people. The sampling technique is

purposive sampling using inclusion criteria and exclusion criteria selected from the research population. Inclusion criteria are babies aged 0-24 months with complaints of cough and cold without fever with maximum complaints in the first 7 days since the occurrencesymptom commoncold. Exclusion criteria are babies who have symptoms of fever, seizures.SubjectThe research obtained as many as 5 people.

This research uses interviews with respondents' parents, observation sheets, Borg score assessment sheets. The materials used are lemon oil, infrared lamps. The implementation of this research is to provide chest and infrared physiotherapy simultaneously for 50 minutes with 4 sessions (1 session for 12 minutes) alternating the chest and back and repeating 1 round twice a day for 3 days. Evaluation was carried out on day 3.

Results and Discussion

The assessment and implementation was carried out in stages for 5 respondents. On September 16 2023, the assessment and implementation of day 1 was carried out by providing therapy to 3 respondents (1,2,3) which will last until September 18 2023 and the assessment andimplementationfor 2 respondents (4.5) it was carried out from 17 September 2023 to 20 September 2023.

The assessment carried out included the respondent's identity, main complaint, respiratory frequency examination, physical examination of the lungs, and assessment of shortness of breath using the Borg scale. Based on the results of the study, data was obtained from 5 respondents, namely respondent 1 (An. A, 7 months old with complaints of coughing and cold without fever. On the 4th day, the baby was fussy and couldn't sleep. He was breathing more quickly, S: 36.5ºC RR: 56x/minute, physical examination of the lungs : frequencyRespiratory tachypnea, the shape of the chest is normal, percussion sounds sonor, on auscultation there are rhonchi, location of secretionsin theleft lobe) Borg score: moderate, respondent 2 (An. R, 3 months old with complaints of cough and cold without fever, day 2, fussy baby, S: 36.6ºC RR: 52x/minute, lung physical examination: frequencyRespiratory tachypnoea, the shape of the chest is normal, percussion sounds sonor, on auscultation there are rhonchi, location of secretionsin theright lobe) Borg score: moderate, respondent 3 (An. C aged 15 months with complaints of cough and cold without fever on day 4, S: 36.7 ºC RR: 40x/minute, physical examination of lungs: respiratory frequencytachypnea, the shape of the chest is normal, percussion sounds sonor, on auscultation there are rhonchi, location of secretionsin theleft lobe) Borg score: moderate, respondent 4 (An.tachypnea, the shape of the chest is normal, percussion sounds sonor, on auscultation there are rhonchi, location of secretionsin theright lobe) Borg score: mild, respondent 5 (An. G, 10 months old with complaints of cough and cold without fever, day 2, shortness of breath, fussy child unable to sleep well, S: 36.7 ºC RR: 54x/minute, physical examination lungs: respiratory ratetachypnea, the shape of the chest is normal, percussion sounds sonor, on auscultation there are rhonchi, location of secretionsin theright lobe) Borg score: mild.

Implementation for each respondent was carried out twice a day in the morning and afternoon with a duration of 50 minutes. Based on Pangesti (2020), chest physiotherapy in children with pneumonia works effectively if intervention is given twice a day on a regular basis.[13]. The action carried out began with a massage with lemon oil on

the chest and back for 5 minutes then positioning the respondent in a supine sleeping position for intervention on the chest and back. The intervention given is in the form of infrared radiation at a distance of around 30 cm from the chest or back along with physiotherapy combined with cough and cold massage for children.

Rayinfraredis a wave with a power of around 60-1500 watts, which emits visible light (partsmall amount of ultraviolet light) with a resulting wavelength between 3,500-40,000 A[14]. Chest physiotherapy intervention and cough and cold massage for children are given to the chest and back with the same movements. The first movement involves clapping or patting the chest wall or back with your palms facing down to move the secretions. Movementsecondnamely toby top or backintercostalor a movement resembling a scrape between the ribs, moving from bottom to top. Movementthirdnamely vibration orvibrationorknockusing the tips of your fingers gently from the bottomto the top.Movement fourthnamely pitching or crab movements or sliding movements such as pinching from belowto the topon the chest or back. On the back, position the child on his stomach to help the gravity of the sputum to come out. In line with research from Yulianti (2021), massage therapy can reduce complaints of ARI andfrequencycough in toddlers in LatuHusadhaAbiansamal Bandung[15].

Chest physiotherapy combined with cough and cold massage movements in children makes it easier for sputum stuck to the respiratory tract to come out. Chest and infrared physiotherapy are carried out together, with a duration of 12 minutes in 1 position, this procedure is carried out in 4 positions (2 times chest 2 times back), after radiation and chest therapy have been completed.heldthen continue on the back and repeat 1 time (back to the chest followed by the back). Pause the exposure time to prevent skin irritation from ultraviolet light in the lampinfraredbecause baby's skin is still very sensitive. In line with research from Dewi (2022) which proves that an effective way to increase airway clearance in children with pneumonia is by providing chest physiotherapy for 15 minutes (Dewi, 2022)[16].

Evaluation is carried out on the 3rd day after the therapy is completed. On the 3rd day, data was obtained, namely 3 respondents (60%), sputum came out through the mouth spontaneously after coughing, on the 2nd day 2 respondents (67%) and on the 3rd day 1 respondent (34%), the sputum could not come out. in 2 respondents (40%) but the frequency of coughing decreased on day 2. Thisprovethat the application of chest physiotherapy and infrared can help sputum discharge in toddlers 0-24 months after the intervention is carried out more than twiceperiodically. Pangesti's research (2020) proves that after being given chest physiotherapy intervention in the form of clapping and vibration in toddlers aged 3-5 years who produce sputumas big as(73.3%) and those who did not produce sputum were (26.7%)[13]. This is in line with research from Hidayatin (2019) showing that the first implementation of chest physiotherapy did not show changes in airway clearance but was effective after the second implementation on the second day.[17].

The ability to expel sputum in babies or toddlers is influenced by several factors including age because toddlers are not yet able to expel sputum themselves, but sputum expulsion can occur because there is a strong urge from the cough reflex so thatgive rise toSpontaneous vomiting containing mucus and sputum, in toddlers who do not produce sputum, there is a possibility that the sputum

comes out through the digestive tract due to the inability to expel sputum through the mouth. In this respondent, an improvement in the condition can be seen with a reduced frequency of coughing.

In examining the respiratory frequency and physical examination of the lungs after implementation on respondents. The results of the respondent's examination are an. A respiratory frequency:35x/minute and borg scale: no complaints of shortness, An. R respiratory frequency: 38x/minute and Borg scale: no complaints of shortness of breath, An. C respiratory frequency 30x/minute and Borg scale: no complaints of shortness of breath, An. D frequencyRespiratory28x/minute and Borg scale: no complaints of shortness, , An G frequencyRespiratory48x/minute and Borg scale: no complaints of shortness of breath. In line with research from Pangesti (2020), chest physiotherapy can reduce shortness of breath in children with asthma.[13].

In the physical examination of the lungs, 4 respondents showed improvement in their condition with the results of all respondents in the physical examination of the lungs inspecting rhythm and frequencybreathingnormal chest, sonor percussion, no rhonchi were heard on auscultation and 1 respondent to auscultation examination still heard light rhonchi. In line with research fromAmen(2018) which shows that this occurschangeRespiratory frequency and Borg scale values experienced significant changes after chest and infrared physiotherapy were carried out so that they could reduce shortness of breath in bronchopneumonia patients.[18].

Based on the results of this research, it shows thatapplychest physiotherapy techniques andinfraredhas effectiveness in increasing airway clearance in toddlers aged 0-24 months as assessed by decreasing frequencyRespiratory, reduced shortness of breath, sleep better. This is because infrared therapy combined with chest physiotherapy can restore muscle function which can help the respiratory tract and remove sputum from the lung walls. Based on research from Izza (2020)showingthat physiotherapy management with nebulizers, infrared and chest physiotherapy for bronchial asthma 4 times showed improvement in the condition withdeclinefrequency of coughing, reduced shortness of breath and increased expansioncage thorax[14]. In line with research from Kahasto(2021) stated that infrared and chest physiotherapy can increase cage expansionthoraxand repairfrequencybreathing, reducing shortness of breath, helping to expel sputum and effective airway clearance[19].

Conclusion

Based on this research, it can be concluded that the application of chest physiotherapy and infrared simultaneously carried out 2 times a day for 3 days with a duration of 50 minutes, each intervention is effective in overcoming the problem of airway clearance which can be assessed from respondents who produced 60% of sputum and no sputum came out. by (40%), decreased respiratory frequency (normal), improved Borg score with no complaints of shortness of breath, and improved the quality of children's sleep more soundly in toddlers aged 0-24 months withcommoncold.

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