World Journal of Biology Pharmacy and Health Sciences
eISSN: 2582-5542
Cross Ref DOI: 10.30574/wjbphs
Journal homepage: https://wjbphs.com/

(RESEARCH ARTICLE)

A case series to evaluate the efficacy of *Trijata gutika* in the management of Kasa with special reference bronchitis

SAKSHI BALI *, NITIN MAHAJAN HOD and RADHIKA GUPTA

Department Of Kayachikitsa, Jammu Institute of Ayurveda and Research, 181123, J&K, India.

World Journal of Biology Pharmacy and Health Sciences, 2026, 27(02), 030–039

Publication history: Received on 22 June 2026; revised on 01 August 2026; accepted on 03 August 2026

Article DOI: https://doi.org/10.30574/wjbphs.2026.27.2.0417

Abstract

Kasa is one of the pathological conditions explained in many contexts in *Ayurvedic* texts. *Kasa* may develop as an independent disease, a *lakshana* associative to other disease or as *Upadrava* of a disease. Understanding and differentiating the *Kasa* is most important to treat the condition effectively. In the present era *Kasa* is the most common disease affecting a large aged population. Kasa is one of the *Pranvaha Strotodusthijanya Vyadhi*. The vitiated *Prana Vayu* along with *Udana Vayu* which further gets aggravated in association with other *Doshas* and expelled out forcefully with a "coughing sound" like the broken bronze vessel, called as *Kasa*.

In *Ayurveda*, based on the similarity in signs and symptoms, the *Kasa* nearest correlation is Bronchitis.

Keywords: *Kasa; Samprapti; Pranavaha Strotas; Upshaya*

1. Introduction

Ayurveda is the first and foremost spiritual science that offers a scientific approach to live in harmony with nature. *Ayurveda* is the most ancient healing science and ideal approach for an appropriate life style. According to this science, proper choice of *Ahara* and *Vihara* helps to achieve healthy life by maintaining and or restoring equilibrium of the body and mind.

Prana and *Udana Vayu* play a role in maintaining the proper functioning of the respiratory channels *(Pranavaha Strotas). Kasa* occurs when imbalanced *Kapha* obstructs the smooth flow of *Prana Vayu* in the throat and chest. This imbalance causes *Kasa*, where disturbed *Prana Vayu* and *Udana Vayu* create sounds reminiscent of striking broken pieces of bronze[1]. *Kasa* can be an independent ailment or a symptom of various other diseases.

Acharya Charak, identified five types of *Kasa*: *Vataja, Pittaja, Kaphaja, Kshataja, and Kshayaja*[2].

Acute bronchitis (AB) is an upper respiratory illness characterized by inflammation of small and large airways and their lining. It is usually a self-limiting disease with symptoms lasting about 2 to 3 weeks. It is one of the most commonly presenting illnesses among outpatients and frequent reasons of visit to primary care physicians.

Kasa is often triggered by factors like exposure to dust, smoke, strenuous exercise, consuming excessively dry food, inhalation of food particles, and suppressing natural urges like coughing and sneezing[3]. *Kasa* has been described under various categories in the classics of *Ayurveda* as an independent disease, symptom, complication and sequel. Due to the various similarities in clinical presentation, *Kasa* is correlated with cough (Bronchitis)[4].

* Corresponding author: SAKSHI BALI.

2. Material and methods

2.1. Study design

The total of 30 subjects, fulfilling the inclusion criteria of *Kasa* with special reference to Bronchitis and who will be willing to give written informed consent will be selected for the present study, who will be visiting Out Patient Department (OPD) or In Patient Department (IPD) of Jammu Institute of *Ayurveda* and Research and Shri Sain Charitable Trust and Hospital urban wing Janipur, irrespective of their gender,religion, occupation and Socio-economic status.

3. Methods of data collection

3.1. Study Design

A randomized, open labelled, active controlled pre and post test clinical study.

Table 1 Approvals from ctri and ethical comittee

Approvals	Registration Number	Status Of Approvals	Date
Institutional Ethical Comittee	Jiar/2024/445	Approved	11/05/24
Ctri	Ctri/2025/03/083219	Approved	24/03/25

- **Sample Size:** Sample size of 30 subjects will be randomized into 2 groups comprising of 15 subjects in each. A special Case Report Format (CRF) containing all the necessary details pertaining to the study will be prepared. Data obtained in both the groups will be recorded, tabulated, and statistically analyzed.
- **Sampling Technique:** Subjects will be randomized in two groups.

Randomization: Randomization will be done by using randomization software from www.randomizer.org

Table 2 Randomization of patients

GroupA (Experimental)	2	4	6	8	9	11	13	16	19	20	22	25	26	28	30
Group B (Control)	1	3	5	7	10	12	14	15	17	18	21	23	24	27	29

- **Grouping: Group A:** *Trijata gutika* (Trial group)
  Group B: *Sitopladi churna* (Controlled group)

- Total study duration: Total study duration - 30 days
  Trial duration – 15 days
  Drug free followup – 15 days

3.2. Method of prepration of trial drug

- . The raw ingredients of the trial drug *Trijata gutika* will be taken in different ratio.
- *Twak, Ela,Tejpatra, Pippali, Sita,Draksha, Mulethi, Khajoor ,* will be made into fine powder in the pharmacy of Department of *Rasa Shastra and Baishajya Kalpana*, Jammu Institute of *Ayurveda* and Research, Jammu. These ingredients will be made into fine powder in the pharmacy of Department of *Rasa Shastra and Baishajya Kalpana*, Jammu Institute of *Ayurveda* and Research, Jammu.
- *Churna* of all Drugs will be formulated into Kalka form.After this *Gutika* will be made by adding *Madhu*

3.3. Posology

3.3.1. GROUP A

- **Yoga:** Trijata gutika
- **Dosage:** 250 mg qid
- **Duration:** 30 Days
- **Follow Up: -** on 15th Day and 30th Day
- **Drug Free Follow Up:** - on 30th Day.

3.3.2. GROUP B

- **Yoga:** Sitopladi churna
- **Dosage:** 3gms with honey
- **Duration:** - 30 Days
- **Follow Up: -** on 15th Day, 30th Day
- **Drug Free Follow Up:** - on 30th Day.

3.3.3. Inclusion criteria

- Subjects aged between 20-50 years.
- Subject presenting with classical clinical features of *kasa* (Bronchitis)

3.3.4. Exclusion criteria

- Subjects who do not fulfil inclusion criteria will be excluded.
- Subjects with other systemic disorders like CHD, diabetes, hepatorenal complication etc.
- Subjects with bronchial asthma, Allergic bronchitis, pneumonia, pulmonary tuberculosis and other respiratory illness.
- Cough associated with severe malnutrition.
- Cough associated with neurological disorders.
- Immune- compromise conditions.
- Pregnant and lactating women.

3.3.5. Assesment criteria

Assessment criteria will be done before and after the treatment adopting the following criteria:

3.4. Subjective parameters:

- *Shushka Kasa*
- *Alpakapha Nishtiva*
- *Shola Hrita /Parshwa/Udara/Shira/Shakh*
- *Urovidah*
- *Trishna*
- *Jwara*
- *Kasa Nishtivana*
- *Peenas*
- *Agnimandya*

The subjective parameters are mentioned below:[15,16,17]

Table 3 Subjective Criteria

VATAJ KASA	***SHUSHKA KASA***	**GRADE 0**	**No cough**
		GRADE 1	Mild irritant dry cough but does not disturb the night sleep.
		GRADE 2	Moderate irritant dry cough which disturbs the night sleep but subside after medication.

		GRADE 3	Severe irritant dry cough not relieved by any measures and keeps patient awake.
	ALPAKAPHA NISHTIVANA	GRADE 0	Absent
		GRADE 1	Occasional expectoration
		GRADE 2	Expectoration with persistance of cough
	HRITA/ URA/ PARSHWA/ UDARA/ SHIRA/ SHAKA SHOOLA	GRADE 0	Absent
		GRADE 1	Mild and occasional pain during cough.
		GRADE 2	Moderate pain during cough
		GRADE 3	Constant pain

Table 3a *Pittaj Kasa*

PITTAJ KASA	***UROVIDAH***	**GRADE 0**	**Absent**
		GRADE 1	Epigastric burning sensation lasting for short duration and subside itself
		GRADE 2	Continuous epigastric burning sensation but no epigastric tenderness
		GRADE 3	Continuous epigastric burning sensation with epigastric pain
	TRISHNA	GRADE 0	Absent
		GRADE 1	Trishna subsides after drinking of water
		GRADE 2	Patient needs continue drinking of water
		GRADE 3	Not subside after drinking plenty of water
	JWARA	GRADE 0	No fever
		GRADE 1	Between 98-99degree F
		GRADE 2	Between 100-101degree F
		GRADE 3	Above 101degree F

Table 3b *KAPHAJ KASA*

KAPHAJ KASA	***KASA NISHTIVANA***	**GRADE 0**	**No sputum**
		GRADE 1	Sputum early in the morning
		GRADE 2	Sputum 2 - 3 times daily
		GRADE 3	Sputum with each coughing
	PEENAS	GRADE 0	Absent
		GRADE 1	Present
	AGNIMANDYA	GRADE 0	Absent
		GRADE 1	Present

3.5. Objective parameters

Table 4 BSS (BRONCHITIS SEVERITY SCALE)

S no	Features	Grades	Severity
1	COUGH	GRADE 0	No Cough
		GRADE 1	1-2 Episodes of Cough
		GRADE 2	More than 1-2 Episodes of Cough (≤05 Secs)
		GRADE 3	Sustained bouts of Cough (> 05 Secs)
		GRADE 4	Continous Cough (< 30 Secs)
2	SPUTUM PRODUCTION (EXPECTORATION)	GRADE 0	No Sputum
		GRADE 1	Small volume of non-purulent sputum
		GRADE 2	Large volume of non-purulent sputum
		GRADE 3	Purulent sputum
		GRADE 4	Frequent purulent sputum
3	RALES (AUSCULTATION)	GRADE 0	Absent
		GRADE 1	Only one lobe is involved
		GRADE 2	Two lobes are involved
		GRADE 3	Three lobes are involved
		GRADE 4	Both the sides of lungs are inloved
4	CHEST PAIN DURING COUGH	GRADE 0	No Pain
		GRADE 1	Mild and occasional pain
		GRADE 2	Moderate pain during cough
		GRADE 3	Constant pain during cough
		GRADE 4	Constant pain all time
5	DYSPONEA	GRADE 0	Breathlessness only during exercise
		GRADE 1	Breathlessness when hurry on the level or walking up slight hill
		GRADE 2	Walk slower than other people of same age due to shortness of breath and need to stop for breath when walking
		GRADE 3	Shortness of breath after walking few minutes or about 100 yards (90 mtrs)
		GRADE 4	Too breathlessness to leave the house or when dressing or undressing,

4. Result

Table 5 Descriptive Statistics of Group A and Group B.

Clinical parameter	Group A BT Mean ± SD	Group A AT Mean ± SD	Group B BT Mean ± SD	Group B AT Mean ± SD
Shushka Kasa	1.60 ± 0.63	0.47 ± 0.52	2.07 ± 0.59	0.47 ± 0.52
Alpakapha Nishthivana	0.73 ± 0.59	0.00 ± 0.00	1.00 ± 0.53	0.07 ± 0.26
Harita/Ura/Parshwa/Udara/Shira/Shakha Shoola	1.33 ± 0.90	0.33 ± 0.49	2.00 ± 1.00	0.53 ± 0.64
Urovidaha	0.67 ± 0.72	0.53 ± 0.64	1.13 ± 0.52	0.07 ± 0.26
Trishna	1.13 ± 0.52	0.07 ± 0.26	1.07 ± 0.70	0.20 ± 0.41
Jwara	0.40 ± 0.63	0.00 ± 0.00	0.40 ± 0.51	0.00 ± 0.00
Kasa Nishthivana	0.40 ± 0.51	0.00 ± 0.00	0.53 ± 0.52	0.00 ± 0.00
Peenasa	0.27 ± 0.46	0.00 ± 0.00	0.47 ± 0.52	0.00 ± 0.00
Agnimandya	0.80 ± 0.41	0.00 ± 0.00	0.80 ± 0.41	0.00 ± 0.00
Bronchitis Severity Scale	5.47 ± 1.64	1.47 ± 0.74	6.40 ± 1.88	1.60 ± 0.83

Note: BT = before treatment; AT = after treatment; Group A: n = 15; Group B: n = 15.

Table 6 Inter-group Comparison of Clinical Parameters Between Group A and Group B (Independent Samples t-test)

Parameter	Group A Mean ± SD	Group B Mean ± SD	t-value	df	p-value	Significance
Shushka Kasa	0.47 ± 0.52	0.47 ± 0.52	0.000	28	1.000	NS
Alpakapha Nishthivana	0.00 ± 0.00	0.07 ± 0.26	−1.000	14.000	0.334	NS
Shoola	0.33 ± 0.49	0.53 ± 0.64	−0.963	28	0.344	NS
Urovidaha	0.53 ± 0.64	0.07 ± 0.26	2.619	18.440	0.017	Significant
Trishna	0.07 ± 0.26	0.20 ± 0.41	−1.058	23.458	0.301	NS
Jwara	0.00 ± 0.00	0.00 ± 0.00	NC	NC	NC	Complete relief
Kasa Nishthivana	0.00 ± 0.00	0.00 ± 0.00	NC	NC	NC	Complete relief
Peenasa	0.00 ± 0.00	0.00 ± 0.00	NC	NC	NC	Complete relief
Agnimandya	0.00 ± 0.00	0.00 ± 0.00	NC	NC	NC	Complete relief
BSS	1.47 ± 0.74	1.60 ± 0.83	−0.464	28	0.646	NS
TLC	4,340.00 ± 348.06	4,700.00 ± 569.46	−2.089	28	0.046	Significant
Neutrophils	68.13 ± 4.82	71.07 ± 2.49	−2.093	28	0.046	Significant
Lymphocytes	23.53 ± 3.60	25.20 ± 5.81	−0.944	28	0.353	NS
Eosinophils	4.27 ± 0.59	5.27 ± 0.88	−3.638	24.497	0.001	Highly significant
AEC	243.67 ± 68.49	227.33 ± 46.21	0.766	28	0.450	NS

NS: Not significant; NC: t-test not computed because both groups had zero variance.

Table 7 Overall Percentage Improvement in Group A and Group B

Group	Mean Percentage Improvement (%)
Group A	94.30
Group B	80.75

5. Discussion

The present clinical study was undertaken to evaluate the therapeutic efficacy of the trial drug in the management of *Kasa* (Bronchitis) and to compare its effects with those of the control treatment. The assessment was based on subjective clinical symptoms, Bronchitis Severity Scale (BSS), objective laboratory parameters, and overall percentage improvement.

5.1. Discussion on Clinical Parameters

The findings of the present study demonstrated that both Group A and Group B produced significant improvement in the clinical manifestations of *Kasa*. However, the overall percentage improvement was higher in Group A (94.30%) than in Group B (80.75%), suggesting comparatively better clinical efficacy of the trial drug.

5.2. Shushka Kasa

Shushka Kasa is the cardinal symptom of *Kasa* and develops due to the vitiation of *Prana Vayu and Udana Vayu*, leading to irritation of the *Pranavaha Srotas* and repeated bouts of dry cough.

In the present study, the mean score of *Shushka Kasa* reduced remarkably in both groups. The absence of a statistically significant difference between the two groups ($p = 1.000$) indicates that both treatment regimens effectively controlled dry cough. The improvement observed in Group A may be attributed to the *Vata-Kapha Shamaka, Kasa-hara, and Shothahara* properties of the trial drug, which reduce irritation of the respiratory mucosa, facilitate normal movement of *Vata*, and restore the physiological function of the *Pranavaha Srotas*.

5.3. Alpakapha Nishthivana

Alpakapha Nishthivana denotes scanty sputum production caused by increased viscosity of *Kapha* due to aggravated *Vata.*

Group A showed complete relief in this symptom, while only minimal residual symptoms were observed in Group B. Although the inter-group difference was statistically non-significant, the complete disappearance of the symptom in Group A suggests better mucolytic and *Kapha*-expelling action of the trial formulation. The *Ushna, Tikshna, and Sukshma* properties of the ingredients probably liquefied the accumulated *Kapha* and facilitated its easy expulsion.

5.4. Harita/Ura/Parshwa/Udara/Shira/Shakha Shoola

Pain in the chest, flanks, abdomen, head, or extremities occurs because repeated bouts of coughing increase muscular strain and intrathoracic pressure.

Both groups demonstrated marked reduction in pain scores after treatment. Although the inter-group comparison was statistically non-significant, the greater reduction observed in Group A indicates that early control of coughing episodes reduced muscular fatigue and inflammation. The analgesic and anti-inflammatory actions of the trial drug may have contributed to this improvement.

5.5. Urovidaha

Urovidaha (burning sensation in the chest) is mainly associated with aggravated *Pitta* and irritation of the bronchial mucosa.

The inter-group comparison revealed a statistically significant difference ($p = 0.017$). This indicates that one treatment regimen produced superior relief in chest burning. The trial drug possibly alleviated bronchial inflammation, reduced mucosal irritation, and restored normal respiratory function, thereby decreasing the sensation of burning.

5.6. Trishna

Excessive thirst is usually associated with *Pitta* aggravation, fever, dehydration, and continuous coughing.

Both groups exhibited considerable improvement in *Trishna* after treatment, with no statistically significant difference between them. Relief of cough, normalization of body temperature, and restoration of normal metabolism likely reduced excessive thirst.

5.7. Jwara

Jwara was completely relieved in all affected patients of both groups. Since all post-treatment values became zero, statistical comparison was not possible. The complete disappearance of fever indicates effective control of the underlying inflammatory process responsible for acute bronchitis.

5.8. Kasa Nishthivana

Kasa Nishthivana represents expectoration associated with coughing.

Complete relief was observed in both groups after treatment. This suggests that both treatment modalities effectively reduced airway inflammation and normalized bronchial secretions.

5.9. Peenasa

Peenasa (nasal congestion/rhinitis) commonly accompanies upper respiratory tract infections.

Complete disappearance of *Peenasa* in both groups indicates effective reduction of mucosal congestion and inflammation. Improvement in nasal patency also contributes to better respiratory function and reduced irritation of the airways.

5.10. Agnimandya

Agnimandya is frequently observed during acute respiratory illnesses because of impaired *Agni and Ama formation*.

Complete improvement was observed in all patients of both groups. Restoration of digestive fire improves metabolism, enhances immunity, and facilitates faster recovery from respiratory infections.

5.11. Discussion on Bronchitis Severity Scale (BSS)

The Bronchitis Severity Scale is a validated tool for assessing the severity of acute bronchitis.

Both groups demonstrated marked reduction in BSS scores after treatment. Group A showed a reduction from 5.47 ± 1.64 to 1.47 ± 0.74, whereas Group B improved from 6.40 ± 1.88 to 1.60 ± 0.83.

Although the inter-group difference was statistically non-significant ($p = 0.646$), the slightly greater reduction in Group A indicates superior overall clinical recovery. This finding supports the effectiveness of the trial drug in reducing cough severity, sputum production, chest discomfort, and associated symptoms.

5.11.1. Discussion on Laboratory Parameters

Objective laboratory investigations were included to evaluate the inflammatory response associated with acute bronchitis.

5.12. Total Leukocyte Count (TLC)

A statistically significant difference was observed between the groups ($p = 0.046$). Reduction in TLC indicates resolution of inflammation and infection. Better normalization in Group A suggests comparatively greater anti-inflammatory activity.

5.13. Neutrophils

Neutrophil percentage also showed a statistically significant difference ($p = 0.046$). Since neutrophils are elevated during acute bacterial inflammation, their reduction indicates subsidence of the inflammatory process.

5.14. Lymphocytes

No statistically significant difference was observed between the groups (p = 0.353). This suggests that both treatments produced a similar effect on lymphocyte counts.

5.15. Eosinophils

A highly significant difference was observed (p = 0.001). Reduction in eosinophil percentage may reflect decreased airway inflammation and reduced hypersensitivity of the respiratory tract. This finding indicates comparatively better control of airway inflammatory changes.

5.16. Absolute Eosinophil Count (AEC)

Although AEC improved after treatment, the inter-group difference was statistically non-significant (p = 0.450). This suggests that both interventions had a similar influence on absolute eosinophil levels.

5.17. Discussion on Overall Therapeutic Effect

The overall percentage improvement was 94.30% in Group A and 80.75% in Group B.

The greater overall improvement observed in Group A indicates superior clinical efficacy of the trial drug in relieving the signs and symptoms of *Kasa*. The drug appears to have acted by pacifying *Vata and Kapha Dosha*, clearing *Pranavaha Srotas*, reducing bronchial inflammation, facilitating expectoration, improving Agni, and restoring normal respiratory function.

The trial formulation not only reduced the intensity and frequency of cough but also improved associated symptoms such as chest pain, burning sensation, sputum production, nasal congestion, and digestive impairment. Improvement in laboratory parameters further supports its beneficial effect in reducing the inflammatory process associated with acute bronchitis.

Overall, the results of the present study suggest that both treatment regimens are effective in the management of *Kasa* (Bronchitis). However, the higher percentage improvement and better clinical response observed in Group A indicate that the trial drug provides comparatively superior therapeutic benefit and may serve as a safe and effective treatment option for patients with *Kasa*.

6. Conclusion

The present clinical study entitled “A Randomized Open-Label Controlled Clinical Study to Evaluate the Efficacy of Trijata Gutika in the Management of Kasa with Special Reference to Bronchitis” was undertaken to evaluate the therapeutic efficacy of Trijata Gutika in patients suffering from Kasa (Bronchitis) and to compare its effect with the standard control drug Sitopladi Churna.

Kasa is one of the most common disorders affecting the Pranavaha Srotas and is predominantly caused by the vitiation of Vata and Kapha Dosha.

The disease manifests with symptoms such as cough, expectoration, breathlessness, chest discomfort, throat irritation, and impaired quality of life.

The clinical features and pathogenesis of Bronchitis show considerable similarity with Kaphaja Kasa described in Ayurvedic classics.

Therefore, Kasa can be correlated with Bronchitis for clinical and therapeutic purposs.

The present study confirmed that the etiological factors responsible for Bronchitis such as dust exposure, smoke inhalation, environmental pollution, recurrent respiratory infections, and cold climatic conditions closely resemble the Nidanas described for Kasa in Ayurvedic texts.

These factors ultimately lead to Kapha accumulation, obstruction of Pranavaha Srotas, and disturbance of Prana and Udana Vayu, resulting in the manifestation of Kasa.

The probable mode of action of Trijata Gutika can be explained through its ability to liquefy and expel accumulated Kapha from the respiratory passages, reduce inflammation of the bronchial mucosa, improve the functioning of Pranavaha Srotas, restore the normal movement of Prana and Udana Vayu, and strengthen the respiratory system.

The formulation also improves Agni and prevents Ama formation, thereby addressing the disease at its root level.

The clinical observations of the study revealed that Trijata Gutika produced considerable improvement in the major symptoms of Kasa such as cough, sputum production, dyspnoea, chest pain, throat irritation, and associated respiratory complaints.

The symptomatic relief observed during the study indicates the effectiveness of the formulation in reducing both the severity and frequency of respiratory symptoms.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

References

[1] Sushruta Samhita of Maharshi Shushurta, Ayurveda-Tatva-Sandipka, Sutrasthana chapter no-15, shloka no-48 edited by Kaviraja Dr. Ambikadutta Shashtri Varanasi: 11ed, Chaukhambha Sanskrit Sansthan. 2007 pno.64.

[2] Kaviraj Ambikadutta Shastri, *Ayurveda*-tattva Sandipika commentary, *Sushruta Samhita* of *Maharshi Sushruta*, part II Uttartantra, *Sushruta* www.ejpmr.com | Vol 10, Issue 10, 2023. Uttar tantra Varanasi, Chaukhamba Sanskrit Sansthan, 2008; 382: 52 – 5.

[3] Chakrapanidatta, commentator, Ayurvedadipika commentary, Charaka Samhita, of Agnivesha elaborated by Charaka and Dridhabala, Edited by Vd. Yadavji Trikamji Acharya, Chikitsa Sthana, Varanasi, Chaukhamba Surbharti Prakshan, 2011; 538: 18 – 31, 1.

[4] Eun-Jung Jo and Woo-Jung Song, Environmental triggers for chronic cough. Asia Pac Allergy, 2019; 9(2): 16.

[5] Babu SS.The Principles and Practice of Kaya Chikitsa (Ayurveda's Internal Medicine). Varanasi, India: Chaukhamba Orientalia; reprint ed. 2012.p.204. (Vol. II).

[6] Albert RH. Diagnosis and treatment of acute bronchitis. American family physician. 2010;82(11):1345-50.

[7] Kinkade S, Long NA. Acute bronchitis. American family physician. 2016;94(7):560-5.

[8] Wark P. Bronchitis (acute). BMJ Clinical Evidence. 2015;2015.

[9] Wenzel RP. Acute bronchitis and tracheitis. Goldman's Cecil Medicine. 2012:586.

[10] Knutson D, Braun C. Diagnosis and management of acute bronchitis. American family physician. 2002;65(10):2039