Research Article

www.ijrap.net

(ISSN Online:2229–3566, ISSN Print:2277–4343)

ROLE OF AYURVEDIC MEDICINES ON CARCINOMA GALL BLADDER AFTER CONVENTIONAL ANTI-CANCER THERAPY: A RANDOMISED CONTROL TRIAL

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Received on: 08/09/23 Accepted on: 17/11/23

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DOI: 10.7897/2277-4343.15112

ABSTRACT

Gallbladder cancer (GBC) arises from the cystic duct and gallbladder lining, presenting as a thickening in the bile duct wall or a diffuse mass. Arbuda and Gulma are considered malignant tumours in Ayurveda. Acharya Charaka associates Gulma, a type of shotha, with the pittashaya (gall bladder) among the five adhishthans. Acharya Sushruta defines Gulma as "any granthi between hruday and Basti pradesh." Aim: To evaluate the efficacy of Ayurvedic medicine on associated signs and symptoms of carcinoma gall bladder following conventional anti-cancer therapy. Objective: To evaluate the QOL of the studied patient of carcinoma gall bladder following conventional anti-cancer therapy. Materials and methods: 20 patients suffering from the associated signs and symptoms of carcinoma gall bladder following conventional anti-cancer therapy were enrolled and randomly divided into two groups, i.e., Study Group B, Brihat Loknath Rasa 250 mg with lukewarm water, Mahashankh vati 250 mg with buttermilk, and Drakshavleha 6 gm with milk. In Control Group A, patients undergoing modern medicine were observed for 60 days. Results and Conclusion: The analysis of the relief percentage of the (Overall therapy) shows that the % relief for Study Group patients was 43.40% and the relief for Control Group was 38.68%. In conclusion, Ayurveda has the potential for symptomatic management of gallbladder cancer (GBC) by aligning with Pitta pradhan sannipatika Gulma. While a holistic approach and Ayurvedic principles show promise, more research in Ayurvedic oncology is required for validation.

Keywords: Cancer, Gallbladder cancer, Gulma, Arbuda

INTRODUCTION

There is no scarier disease in most people's minds than cancer. Cancer is an incurable, excruciatingly painful condition with no cure. However, it is a common misconception that types of cancer are incurable and fatal. The truth is that there are many types of cancer, many of which can now be successfully handled to prevent, minimise, or slow the disease's impact on patients' lives.

GBC develops from the gallbladder (GB) epithelial lining and the cystic duct. It is the most common form of biliary tract cancer globally, manifesting as either the diffuse thickening of the GB mass or GB wall emerging from the fundus, neck, or body of the GB. The prevalence of this cancer varies significantly by geography and ethnicity. North, East, Northeast, and Central India have a higher gallbladder disease prevalence than South and West India. The incidence in North India is 10-22/100,000 people, comparable to other high-incidence countries such as South America. East Asia and Central Europe are the world's most populous regions[1].

Its clinical appearance is non-specific, which causes significant diagnostic delays. It is identified either accidentally during a cholecystectomy or as a result of problems induced by localised cancer, such as hepatomegaly, duodenal blockage, and ascites. Because the GB is in an anatomically active location, the biological nature of the tumour causes it to spread quickly to nearby important structures. As a result, the tumour is frequently unresectable at the time of presentation, resulting in a usually dismal prognosis in India. Chemotherapy, radiation, and immunotherapy are also not very curative. The majority of centres have a 5-years survival rate of 5 %.

Though the term cancer is new for Ayurveda but, Arbuda and Gulma are very near terms described for malignant tumours as Acharya Charaka has considered Gulma as one type of shotha[2]. Also, from the five adhishthans, Charaka has described parshv as one of the Gulma adhishthans[3]. In his commentary, Acharya Chakrapani also represented the details of the five adhishthans, in which the pittashaya[4] (gall bladder) is one of the Gulma sthana. As per Acharya Sushruta[5], any Granthi between hruday and basti pradesh has been named Gulma. Also, the various symptoms of Gulma are likely to resemble the clinical manifestations of gallbladder cancer[6]. And as Madhav Nidaan, while describing Gulma, has mentioned, any granthi inside koshta is called Gulma[7].

Near about, all the superficial malignant tumours may be included in Arbuda. In contrast, all the malignant growth of the gastrointestinal tract from stomach to colon (amashya, pitashya and vatashya) may be included in Gulma. The clinical manifestations of the Gulma are also likely to be similar to that of carcinoma gallbladder. Thus, it can be concluded that the malignant growth of the gastrointestinal tract from stomach to colon may be included in Gulma.

Aims and Objectives

Aim: To evaluate the efficacy of Ayurvedic medicine in reducing the signs and symptoms of gallbladder carcinoma after conventional anti-cancer treatment.

Objective: To evaluate the QOL of the studied patient of carcinoma gall bladder following conventional anti-cancer therapy."

MATERIALS AND METHODS

The patients attending the OPD of Agada Tantra and Vidhi Vaidyaka, NIA Hospital Jaipur and Oncology OPD BLK Memorial Hospital Karol Bagh Delhi, with the associated signs and symptoms of carcinoma gall bladder following conventional anti-cancer therapy (including surgery, radiotherapy or chemotherapy) and fulfilling the criteria of selection were registered in the study irrespective of caste, religion and gender.

Before starting the clinical trial, IEC obtained approval via letter no. IEC/ACA/2019/1-5 (Dated 28-5-2019). The study has been registered in CTRI (CTRI/2020/03/023912). Informed consent was obtained from each patient willing to participate before starting the study. The detailed history of the patients was filled out in the case record Performa (CRF).

Ingredients of Drakshavleha were procured and formulated from Shri Ram Herbals Akshya Sadan Jaipur, and the other two, namely viz Brihat Loknath Rasa and Mahashankh vati, were bought from the GMP certified companies.

Study Design

- Study type: An Open-label Parallel Randomised Control trial.
- The phase of trial: 2nd
- Target sample size: 20 (10 patients in each group).
- Site/s of study: NIA Hospital, Jaipur and BLK Memorial Hospital - Delhi.
- Method of generating randomisation sequence: computer-generated.
- Method of allocation concealment: SNOSE (Sequentially numbered opaque Sealed envelope)
- Blinding/masking: Open-label.
- Endpoint: Safety and efficacy
- CTRI registration no: CTRI/2020/03/023912
- Estimated duration of trial: 60 days

Treatment Protocol

In the present study, the patients were randomly divided into 2 groups (Group A and Group B) as per the computer-generated randomisation system.

Group A (Control Group): 10 patients with associated signs and symptoms of carcinoma gall bladder following conventional anti-cancer therapy (including surgery, radiotherapy or chemotherapy), who have undergone modern medicine, were closely monitored under co-guide (Onco-surgeon).

Group B (Study Group): 10 patients with associated signs and symptoms of carcinoma gall bladder following conventional anti-cancer therapy (including surgery, radiotherapy or chemotherapy) underwent Ayurvedic medicine.

Follow-up: Follow-up was performed on the 1st and 60th day after the start of treatment.

Posology

1.Brihat Loknath Rasa
Ingredients: Shuddha Parada, Shuddha Gandhaka, Mritabhra Bhasma, Lauha Bhasma, Tamra Bhasma, Varatika Bhasma, Nagavalli swarasa
Dose: 250 milligrams
Route and Time of Administration: orally twice a day with honey after meals
Form of the Medicine: Vati form
Duration: 2 months

2. Mahashankh vati
Ingredients: Panch Lavana, Hingu, Shankha Bhasma, Chincha, trikatu, Gandhaka, Rasa, Shuddha Vatsanabha, Chitraka, Apamarga, Amalaki Rasa, Nimbu Rasa, Chincha Rasa
Dose: 250 milligrams
Route and Time of Administration: orally twice a day with buttermilk after meals
Form of the Medicine: Vati form
Duration: 2 months

3. Drakshavleha
Ingredients: Draksha, Pippali, Sharkara, Yashtimadhu, Shunthi, Tvakkshiri, Dhatri, Madhu.
Dose: 6 grams
Route and Time of Administration: orally twice a day with milk after meals
Form of the Medicine: Avleha
Duration: 2 months

Inclusion Criteria

- The patients between the age group of 30 to 70 years of either sex presented with clinical features of carcinoma gallbladder in biopsy/CECT Abdomen.
- The patient willing to sign the consent forms.

Exclusion Criteria

- Patients suffering from major systemic illnesses like diabetes, liver cirrhosis, myocardial infarction, ischemic heart disease, hypertension, pulmonary tuberculosis, etc.

Criteria of Assessment

Clinical Assessment of Improvement in associated signs and symptoms and QOL in the carcinoma gall bladder. All patients registered for clinical trials looked for any changes in their clinical manifestations and QOL (Quality of Life) and any change before and after treatment. The data was collected from the selected patients.

Assessment shows the Clinical Improvement of associated signs and symptoms of Carcinoma Gall Bladder following conventional anti-cancer therapy
Abdominal pain (shool), bloating (adhman), a lump in the abdomen (granthi), nausea (hrilas), vomiting (chhardi), cramping, yellow tinge to the skin, sclera and nail bed (twak, netra peetta), pale stools (tilpishti vat mala), itching (kandu), weight loss, fever (jwara), constipation (vibandh).
Gradation: None-0, Mild-1, Moderate-2, Severe-3

Assessment of QOL (quality of life) in Cancer Survivors[8]
Pathological Assessment of Patients with associated signs and symptoms of Carcinoma Gall Bladder following conventional anti-cancer therapy: Hb, LFT

OBSERVATIONS

Maximum patients were female. This is probably because GBC is more common in females[9]. The maximum number of patients was between 51 and 60, following that above 60. This may be because GBC is a middle-aged disease in India that mainly occurs in people after 51 years[10]. The maximum number of patients had kroora koshta; this may be because of Vata pradhanayta or Vataj predominance of clinical manifestations of Gulma vyadhi or vice versa. All the patients had sama jihwa; in the clinical experiences, the sama jihwa is found in the patients having chronic constipation and most of the patients of GBC had constipation; hence, in this study, the sama jihwa was found. Most patients had IVA stage followed by stage IVB; few had IIIA, IIIB, and IIB stages, and fewer had stage I and IIA.

Table 1: The effect of therapy on subjective parameters. (Wilcoxon matched-pairs signed-ranks test)

Variable	Group	Mean BT	Mean AT	Mean diff	% relief	SD	SE	P value	Results
Abdominal pain	A	2.200	0.9000	1.300	59.09%	1.059	0.3350	0.0078	S
	B	2.400	1.100	1.300	54.16%	0.4830	0.1528	0.0020	S
Bloating	A	2.400	1.700	0.7000	29.16%	0.6749	0.2134	0.0313	S
	B	2.500	1.100	1.400	56%	0.8433	0.8433	0.0039	S
Abdominal lump	A	1.000	0.9000	0.1000	10%	0.3162	0.1000	0.9999	NS
	B	1.000	0.9000	0.1000	10%	0.3162	0.1000	> 0.9999	NS
Nausea	A	2.100	0.9000	1.200	57.14%	0.6325	0.2000	0.0039	S
	B	1.900	0.7000	1.200	63.15%	0.6325	0.2000	0.0039	S
Vomiting	A	1.200	0.5000	0.7000	58.33%	0.8233	0.2603	0.0625	NS
	B	0.7000	0.1000	0.6000	85.71%	0.8433	0.2667	0.1250	NS
Cramping	A	1.700	0.8000	0.9000	52.94%	0.8756	0.2769	0.0313	S
	B	1.000	0.5000	0.5000	50%	0.7071	0.2236	0.1250	NS
Yellow tinge	A	2.000	0.9000	1.100	55%	0.7379	0.2333	0.0078	NS
	B	1.700	0.9000	0.8000	47.05%	0.4216	0.1333	0.0078	S
Pale stools	A	1.500	1.000	0.5000	33.33%	0.7071	0.2236	0.1250	NS
	B	1.400	0.7000	0.7000	50%	0.6749	0.2134	0.0313	S
Itching	A	-	-	-	-	-	-	-	-
	B	1.200	0.4000	0.8000	66.66%	0.7888	0.2494	0.0313	S
Weight loss	A	1.000	0.7000	0.3000	30%	0.4830	0.1528	0.2500	NS
	B	1.700	0.7000	1.000	58.82%	0.4714	0.1491	0.0039	S
Fever	A	0.6000	0.2000	0.4000	66.66%	0.6992	0.2211	0.2500	NS
	B	0.1000	0.1000	0.000	0%	0.4714	0.1491	> 0.9999	NS
Constipation	A	1.800	1.300	0.5000	27.77%	0.5270	0.1667	0.0625	NS

NS- non-significant, S – significant, SD- Standard deviation, SE- standard error, BT: Before Treatment, AT: After Treatment

Table 2: The effect of therapy on Objective parameters (Paired t-test)

Variable	Group	Mean BT	Mean AT	Mean diff	% relief	SD	SE	t	P	Results
Hb%	A	10.530	10.610	-0.0800	-0.75	1.043	0.3299	0.2425	0.8138	NS
	B	10.630	10.570	0.06000	0.5644	0.4600	0.1454	0.4125	0.6896	NS
Total Bilirubin	A	1.479	0.9410	0.5380	36.37	0.8112	0.2565	2.097	0.0654	NS
	B	6.204	4.786	1.418	22.8562	4.095	1.295	1.095	0.3020	NS
Direct bilirubin	A	1.286	0.7740	0.5120	39.81	1.476	0.4668	1.097	0.3012	NS
	B	3.902	2.743	1.159	29.7027	2.510	0.7937	1.460	0.1782	NS
Indirect bilirubin	A	0.8100	0.8450	-0.0350	-4.320	0.6323	0.2000	0.1750	0.8649	NS
	B	2.521	1.653	0.8680	34.4307	2.632	0.8323	1.043	0.3242	NS
Total protein	A	6.330	7.289	-0.9590	-15.15	1.613	0.5101	1.880	0.0928	NS
	B	7.239	6.478	0.7610	10.5125	1.606	0.5079	1.498	0.1683	NS
Albumin	A	3.720	3.577	0.1430	3.84	0.7162	0.2265	0.6314	0.5435	NS
	B	3.747	3.670	0.0770	2.05497	0.7210	0.2280	0.3377	0.7433	NS
Globulin	A	3.184	3.302	-0.1180	-3.70	0.3744	0.1184	0.9967	0.3449	NS
	B	3.492	3.182	0.3100	8.87743	0.7769	0.2457	1.262	0.2387	NS
A/G ratio	A	1.032	1.033	-0.0010	-0.09	0.2177	0.0688	0.01453	0.9887	NS
	B	1.033	1.042	-0.0090	-0.8712	0.1397	0.0441	0.2037	0.8431	NS
SGOT	A	44.958	26.349	18.609	41.39	18.626	5.890	3.159	0.0116	S
	B	59.838	69.636	-9.798	-16.374	52.931	16.738	0.5854	0.5727	NS
SGPT	A	48.528	33.384	15.144	31.20	18.197	5.754	2.632	0.0273	S
	B	55.085	43.082	12.003	21.7899	43.082	4.235	2.834	0.0196	S
Alkaline phosphate	A	258.67	112.92	145.74	56.34	247.93	78.402	1.859	0.0960	NS
	B	256.40	203.51	52.897	20.6306	219.88	69.531	0.7608	0.4663	NS

NS- non-significant, S – significant, SD- Standard deviation, SE- standard error, BT: Before Treatment, AT: After Treatment

Table 3: Intergroup comparison on subjective parameters (signs and symptoms) – (Mann-Whitney Test)

Variable	Mean Diff		SD±		SE±		P	Results
	Study Group	Control Group	Study Group	Control Group	Study Group	Control Group		
Abdominal pain	0.9000	1.100	0.8756	0.7379	0.2769	0.2333	0.6013	NS
Bloating	1.100	1.700	0.7379	0.8233	0.2333	0.2603	0.1509	NS
Abdominal lump	1.000	0.9000	1.054	0.9944	0.3333	0.3145	0.8717	NS
Nausea	0.7000	0.9000	0.6325	0.7379	0.2000	0.2333	0.5616	NS
Vomiting	0.1000	0.5000	0.3162	0.7071	0.1000	0.2236	0.1337	NS
Cramping	0.5000	0.8000	0.5270	0.7888	0.1667	0.2494	0.4275	NS
Yellow tinge	0.9000	0.9000	0.8756	0.7379	0.2769	0.2333	> 0.9999	NS
Pale stools	0.8000	1.000	0.9487	0.6667	0.3000	0.2108	0.3540	NS
Itching	-	-	-	-	-	-	-	-
Weight loss	0.7000	1.000	0.4830	0.4830	0.1528	0.1528	0.9621	NS
Fever	0.1000	0.2000	0.3162	0.6325	0.1000	0.2000	> 0.9999	NS
Constipation	0.7000	1.500	0.4830	0.7071	0.1528	0.2236	0.0120	S

SD- Standard deviation, SE- standard error

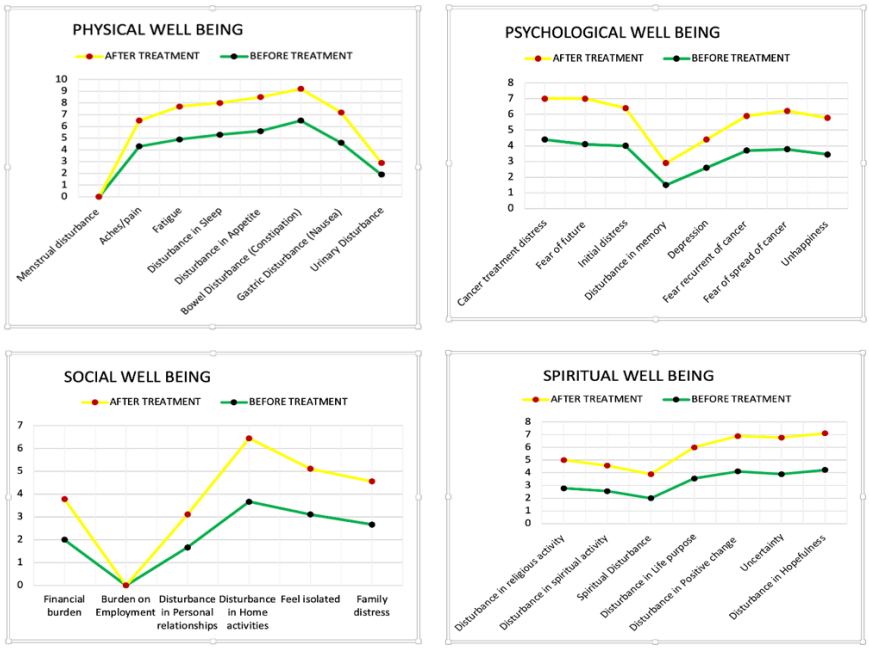

Figure 1: **Effect of therapy on subjective parameters (QOL) Study Group**

Figure 2: **Effect of therapy on subjective parameters (QOL) Control Group**

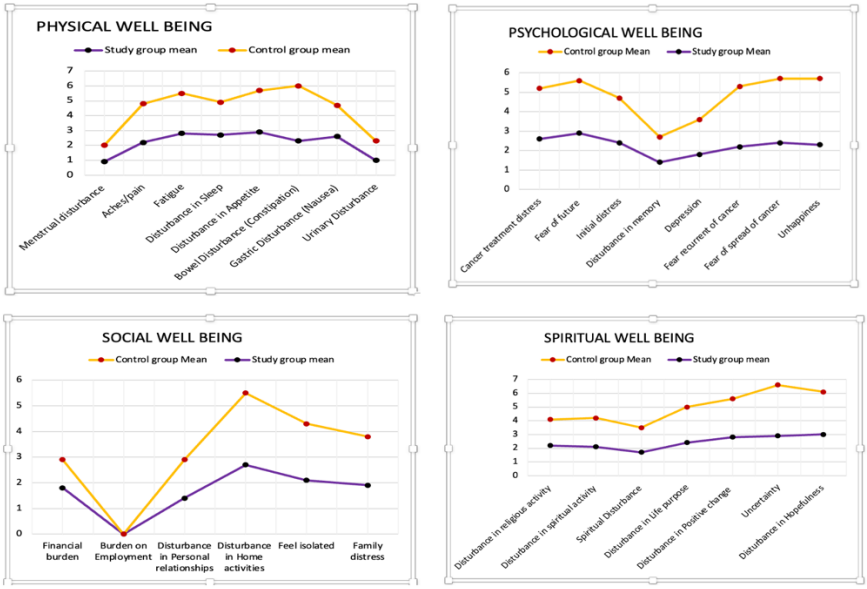

Figure 3: **Intergroup comparison on subjective parameters (QOL) – (Mann-Whitney Test)**

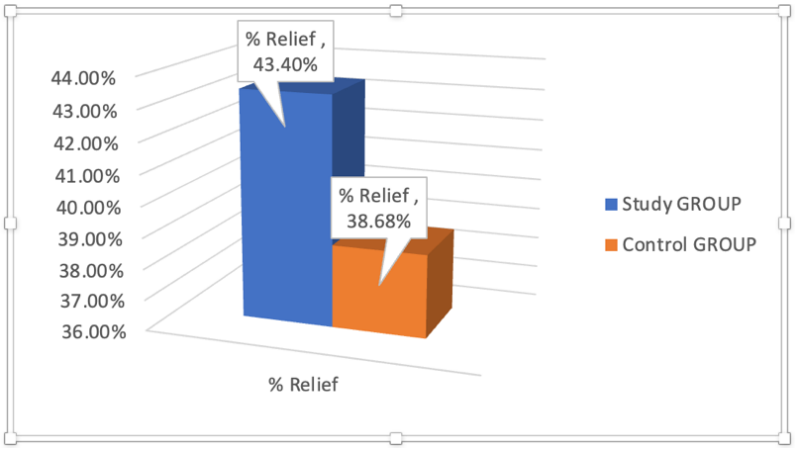

Figure 4: Overall effect of therapy

RESULTS

Intra Group Comparison

The effect of therapy on subjective parameters (Wilcoxon Matched Pairs Signed Ranked test): The Study Group showed significant results on the symptoms- Abdominal pain, bloating, nausea, yellow tinge, pale stools, itching, weight loss and constipation. Control Group showed significant results in abdominal pain, bloating, nausea, cramping and yellow tinge (Table 1).

The effect of therapy on Assessment of QOL (quality of life) in Cancer Survivors (Wilcoxon Matched Pairs Signed Ranked test): Study Group showed significant results on the symptoms of aches/pain, fatigue, disturbance in sleep, disturbance in appetite, bowel disturbance (constipation), gastric disturbance (nausea), cancer treatment distress, fear of future, initial distress, depression, fear recurrent of cancer, fear of spread of cancer, unhappiness, anxiety, disturbance in-home activities, feel isolated, disturbance in life purpose, disturbance in positive change, uncertainty, disturbance in hopefulness. The Control Group showed significant results in aches/pain, fatigue, disturbance in sleep, disturbance in appetite, bowel disturbance (constipation), gastric disturbance (nausea), urinary disturbance, cancer treatment distress, fear of the future, initial distress, depression, fear recurrent of cancer, fear of the spread of cancer, unhappiness, anxiety, disturbance in personal relationships, disturbance in-home activities, feel isolated, family distress, disturbance in religious activity, disturbance in life purpose, disturbance in positive change, uncertainty, disturbance in hopefulness. (Figures 1 and 2)

The effect of Therapy on Objective Parameters - Pathological Investigations in Study Group (Paired t-test): The Study Group showed significant results in SGPT and the Control Group in SGOT and SGPT. (Table 2)

Inter Group Comparison

An intergroup comparison was performed to assess the effectiveness of the two therapies. We employed the Mann-Whitney Test for statistical analysis because the variables were nonparametric. The constipation and bowel disturbance showed significant results. An unpaired t-test was used to evaluate the effect of therapy on the objective parameters. All the parameters were found to have no statistical difference.
(Table 3 and Figure 3)

The overall effect of therapy

The analysis of the relief percentage of the (Overall therapy) shows that the % relief for Study Group patients was max. 43.40% and the relief for the Control Group was 38.68%.
(Figure 4)

DISCUSSION

In this study, the patients were divided into two groups, i.e., the Study Group, where Ayurveda medicine was given and the Control Group, where modern medicine was given.

In the Study Group where the Ayurvedic medicines were given, the significant result was found in abdominal pain and bloating may be because of the effect of Mahashankh vati, as all the ingredients in this drug were deepan pachan nature. In the case of nausea, yellow tinge, pale stools, and itching were also found significant, that may be because of Yakrit, Pliha rogadhikar of Brihat Loknath Rasa, weight loss, constipation were also found significant, that may be because of balya, mruduvirechak and rasayan effect of Drakshavleha. The QOL has been measured by using the quality of life assessment scale for cancer survivors by WHO. In the case of physical wellbeing, aches, fatigue, sleep disturbance, appetite disturbance, bowel disturbance, and nausea were found to be significant. In the case of psychological wellbeing cancer treatment, stress, fear of future, initial distress, depression, fear of recurrent cancer, fear of spread, happiness and anxiety were found significant. In the case of social wellbeing disturbance in-home activity, feeling isolated was significant. In the case of spiritual wellbeing, disturbance in life purpose, disturbance in positive change, uncertainty and hopelessness were significant in the result.

In the Control Group where modern medicine has been given, significant results have been found in the case of abdominal pain, nausea, bloating and cramping; it may be because of analgesics and proton pump inhibitors, respectively. In the Control Group, the QOL was measured using the quality of life assessment scale for cancer survivors by WHO. In the case of physical wellbeing, aches, fatigue, sleep disturbance, appetite disturbance, bowel disturbance, nausea, and urinary disturbance were found to be significant. In the case of psychological wellbeing, cancer treatment stress, fear of the future, initial distress, depression, fear of recurrent cancer, fear of spread, happiness and anxiety were found to be significant. In the case of social wellbeing, disturbance in personal relationships, disturbance in-home activity, feeling isolated, and family distress were discovered to be significant. In the case of spiritual wellbeing, disturbance in religious activity, disturbance in life purpose, disturbance in positive change, uncertainty and hopelessness were found to be significant.

In the intergroup comparisons of clinical effects, constipation showed significant results probably because Draksha in Drakshavleha is mrudu virechak in nature and also due to Mahashankh vati, which has Amla as one of the ingredients, which also acts as mruduvirechak. In QOL, in the case of physical wellbeing, bowel disturbance in physical wellbeing was found to be significant; this is most probably due to Draksha, which acts as the mrudu virechak and also due to Mahashankh vati, which has Amla as one of the ingredients, which is also mrudu virechak. In other parameters, no statistical difference was found in all the symptoms.

A maximum percentage of patients got moderate relief, and a minimum got excellent relief.

Brihat Loknath Rasa was one of the medicines selected in this study taken from Rasendra Sar Sangreh; it has 1 part Shudha Parad, Shudha Gandhaka, Mritabhra Bhasma, 2 parts of Shudha Lauha Bhasma, Shudha Tamra Bhasma, and 6 parts of Varatika Bhasma, Nagavalli Swarasa as bhawna dravya. As per the reference, it is indicated in Yakritpliha, Gulma vikaars and GBC is similar to Pitta pradhan sannipatika Gulma. The Brihat Loknath Rasa has the choice of drugs, as mentioned in Gulma. GBC also affects the liver and Brihat Loknatha Rasa is also indicated in Yakrit vikar. Most of the ingredients in this have ushna, tikshna property, ushna virya, and katu vipka, which have Vatakapahnshaka property as GBC is similar to Pitta pradhan sannipatika Gulma. The growth of GBC mass usually happens due to Kapha virkruti, which in turn increases due to Vata vikriti. Also, in a study, *Piper betel* leaf extracts showed a significant anti-cancer effect against EAC in mice, potentially through regulating lipid peroxidation and enhancing endogenous antioxidant defence systems[11]. Hence, the Brihat Loknatha Rasa was selected for the study as one of the drugs hypothesising the mass reduction. However, there was no significant reduction in the GBC mass in the Study Group during the entire duration of the study clinically, though it wasn't evaluated radiologically. The 2nd choice of drug was Mahashankha vati, which is again referenced drug from Bhaishajya Ratnavali; it has Pancha Lavana, Trikatu, Hingu, Chincha, Shankhabhsma, Parad, Ganddhaka, Vatasnabha, Chitraka, Apamarga, Amla Ras And Nimbu Rasa. Most of them are working on one of the symptoms of GBC, which is agnimandya. Mandagni is the root cause of the diseases, so this drug might help in agnivardhan; in this compound, the maximum drugs were ushan virya, which might help in pacifying Kapha as well as agnivardhan. The third choice of the drug was Drakshavleha, which is a referenced drug from Ashtanga Hridaya. It has Draksha, Pilppli, Sharkara, Yashtimadhu, Shunthi, Tvakkshiri, Dhatri and madhu. The patients with cancer have compromised immune systems. The drugs in Drakshavleha are madhura ras pradhan and have rasayana properties, which may help the patient develop immunity and strength.

CONCLUSION

Although there is no direct reference to GBC in Ayurveda, the clinical signs and symptoms of Pitta pradhan sannipatika Gulma have been observed to be similar to GBC. As a result, GBC can be managed using the basic principle of Gulma chikitsa. According to Ayurveda, mithya ahar vihar is one of the major causes of Gulma, which can lead to obesity and cholelithiasis, both of which are known risk factors for GBC. Constipation and bowel disturbance were more significant in the Study Group than in the Control Group due to improved digestive system and liver function. Most of the drugs have Vata nashak and anulomaka properties which play an important role in relieving flatulence. Hence, constipation and bowel disturbance were found to be significant. Brihat Loknath Rasa is indicated for Pliha, Gulma, Yakrit and Shvethu. Therefore, it may have acted on GBC by improving the liver's and GB's functions and also may have decreased the peripheral inflammation around it. The second drug, Mahashankh vati, is indicated for mandangni and ajeerna, which again are the major symptoms found in GBC. Hence, Mahashankha vati has played a vital role in improving digestion and abdominal pain. The third drug Drakshaavleha, which is indicated in Jaundice. The main ingredients of this drug are Draksha, which is balya, rasayana and mrudu virechak. Pippali, which is rasayan, deepan and pachan and Dhatri, which is rasayan and mrudu virechak. Thus, Ayurveda also has the potential to manage GBC symptomatically without using modern medicine with the help of a holistic approach and basic principles of Ayurveda. However, there is a further need for extensive research

in Ayurvedic oncology from all directions. No major side effects or ill consequences were found in either group during the entire clinical trial.

ABBREVIATIONS

1. CECT - Contrast-Enhanced Computed Tomography.
2. SGOT- Serum glutamic-oxaloacetic transaminase
3. SGPT - Serum Glutamic Pyruvic Transaminase.
4. GB – Gall bladder
5. GBC – Gallbladder carcinoma/cancer
6. Hb - Haemoglobin
7. LFT- Liver function tests
8. S - Significant
9. NS – Non significant
10. CTRI – Clinical trial registry of India
11. EAC - Ehrlich-Lettre ascites carcinoma

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Cite this article as:

Priyanka Katru, Sharad Porte, Ashwani Sharma. Role of Ayurvedic medicines on Carcinoma Gall bladder after conventional anti-cancer therapy: A Randomised Control Trial. Int. J. Res. Ayurveda Pharm. 2024;15(1):49-55
DOI: http://dx.doi.org/10.7897/2277-4343.15112

Source of support: National Institute of Ayurveda, Jaipur, Rajasthan, India, Conflict of interest: None Declared