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The role of aromatherapy in the treatment of viral hepatitis ☆

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Summary Hepatitis B and C constitute an important problem for public health. Currently in France, the prevalence of hepatitis C (HCV) is estimated at 1.1% (approximately 500,000 people 80% of which are viraemic). Its worldwide prevalence is 3%. The prevalence of hepatitis B (HBV) is between 0.2% and 0.5% (at least 100,000 people). 85–90% of persons with HCV go onto develop chronic hepatitis whereas for HBV, this is only 5–10% in immunocompetent carriers.

For HCV, the current treatment is bitherapy with interferon pegyl alpha-2a or alpha-2b (IFN-α) and ribavirin. This leads to eradication of the virus in almost 85% of patients infected with genotype 2 or 3 and only 50% in those with genotype 1. Negative side effects of treatment are common.

For HBV, allopathic treatments rely on IFN-α and nucleoside analogues such as lamivudine and adefovir. The objectives of treatment are to render the virus non-infective rather than lead to virus eradication.

This study was conducted on 60 patients that were chronic carriers of hepatitis B or C (50 HCV and 10 HBV). 42 women and 8 men were recruited between the ages of 12 and 75 years. Essential oils such as ravintsara, Labrador tea, carrot seed, thyme ct thujanol, laurel, niaouli and helichrysum were used orally either in monotherapy or as a complement to allopathic treatment. In patients with HCV treated with bitherapy and essential oils, tolerance and response to treatment was improved (80% good tolerance and 100% complete response especially for genotype 1). For patients with HCV treated with monotherapy (essential oils), an improvement in hepatitis was noted in 64% of cases. For HBV, two cures were obtained with essential oils in monotherapy.

Treatment with essential oils may thus offer treatment opportunities either in monotherapy or as complements to allopathic interventions.

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General introduction to hepatitis C and B

The viruses that are responsible for chronic hepatitis are the viruses hepatitis B, C, D and G. Chronic hepatitis is diagnosed when transaminase levels are elevated to more than twice their normal ranges for more than six months.

Hepatitis C

Hepatitis C is a relatively frequent infection. In France it is responsible for 2000 deaths per year and accounts for 20% of cases of acute hepatitis, 70% of chronic hepatitis, 40% of cirrhosis, 60% of hepatocellular carcinoma and 30% of liver transplants (Alter, 1995; Desenclos, 2000).

The hepatitis C virus is an RNA virus with a highly variable genome (Asselah et al., 2000). This variability is the cause of the emergence of several genotypes, numbered 1—6. In France, genotype 1 is the most common.

Transmission of HCV is essentially blood born. The two main modes of transmission are intravenous drug abuse and via contaminated blood transfusion. Transmission from mother to child is rare.

Hepatitis C is a disease whose evolution is extremely variable from one person to another and is often slow to progress. Infection with HCV leads to inflammation of hepatocytes. This may be of short duration (acute hepatitis) or prolonged with a duration in excess of 6 months (chronic hepatitis). The acute phase is usually asymptomatic. Diagnosis is based on viral serology. After contamination, healing can be spontaneous (10—15% of cases) and even though transaminase levels normalise and there is no virus detectable in the blood, antibodies may remain detectable for numerous years. The presence of these antibodies does not confer immunity to subsequent infection.

The progression to chronicity occurs in 85—90% of cases. This high rate of progression is due to the above-mentioned high genome variability. This is responsible for permanent mutations that permit this RNA virus to escape immune defences. In the absence of healing, the virus remains in the hepatocytes and the immune response provokes the lesions typical of chronic hepatitis (Ratziu et al., 2003). This chronic inflammation is responsible for a progressive fibrosis with scar tissue that can end in cirrhosis of the liver that may remain undetected for years. Once cirrhosis is established, the incidence of developing hepatocellular carcinoma is at 3—5% per year.

Screening and diagnosis

It is advisable to routinely screen persons considered high risk of hepatitis C (Monnet et al., 2000). These include:

- Persons who received blood transfusions or blood products before 1991.
- Haemophiliacs.
- Patients on dialysis.
- Children born to a HCV infected mother.
- Drug users.
- Organ donors.
- Persons positive for HBV or HIV.
- All cases of unexplained fatigue.
- All cases of elevated serum transaminases.

Diagnosis is obtained through serological testing: initially looking for the presence of anti-HCV antibodies using the ELISA Test (3rd generation). If positive, the next step is to identify the presence of the RNA virus in the blood using the polymerase chain reaction (PCR) technique. The ELISA tests are generally reliable in immunocompetent persons but less so in those immunocompromised or on haemodialysis.

Treatment

Treatment is normally offered in all subjects who have a positive viraemic diagnosis and who have a moderate to severe hepatitis (determined by Fibrotest or biopsy). Patients with 'minimal' hepatitis or whose transaminase levels are normal do not require treatment unless they demand it or if there are other extra-hepatic signs that necessitate viral eradication (Conference Internationale, 2002).

The reference treatment in 2005 is bitherapy, associating interferon pegyl alpha-2a or alpha-2b (IFN-α) and ribavirin. Tritherapy that includes amantadine with the other two drugs has not yet demonstrated superior efficacy (Deltenne et al., 2004).

The duration of treatment is 48 weeks for genotypes 1, 4, 5 and 6, providing that the viral load by the 12th week is nil or significantly reduced. For genotypes 2 and 3, treatment duration is usually 24 weeks although this may be reduced to 16 in certain cases where there is rapid virological response (Conference, 2005).

Success rates in treating Hepatitis C are largely determined by genotype. In 2005, expected response rates (complete and prolonged with eradication of the virus for greater than 6 months) are:

50% for genotype 1.
60—70% for genotype 4.

Table 1 Side effects of biotherapy

Side effects linked to interferon	Side effects linked to ribavirin
Pseudo flu syndrome	Haemolytic anaemia
Mood alteration and depression	Pruritis
Hypo and hyper thyroidism	Teratogenicity
Other autoimmune disorders	Mitochondrial toxicity
Alopecia (partial)	
Anaemia, leucopoenia, thrombopoenia	

80% for genotype 2.
90% for genotype 3.
(Diago et al., 2004; Mangia et al., 2004; Zeuzem et al., 2004).

The viral load is also influential in treatment success; the weaker the viral load, the better the response to bitherapy treatment.

Despite the rapid therapeutic progress in recent years, these treatments bring significant negative side effects. These effects are numerous and usually dose-dependent. The main ones are listed in Table 1.

It is important to evaluate tolerance capacity before treatment begins. This includes taking into account depressive states (old or recent) and pre-existing autoimmune dysfunction that may be aggravated by treatment (in particular thyroid disorders). Contraindications to bitherapy include severe uncontrolled depression, auto-immune disease, pregnancy or planned pregnancy in the short term and existing symptomatic liver cirrhosis.

Hepatitis B

Hepatitis B represents one of the principal problems of worldwide public health; approximately 350 million people are chronic carriers of HBV. Metropolitan France is a country with low endemic disease (0.2—0.5% prevalence) (Pol, 2005). 5—10% of infected persons that are immunocompetent become chronic carriers; this percentage is drastically increased in newborns (80%). 15% of deaths in France due to cirrhosis or hepatocellular carcinoma are linked to HBV.

The hepatitis B virus is an enveloped DNA virus. Infection may be transmitted by sexual contact, intravenous administration or perinatal transmission (Pol, 2005). In France, the main modes of transmission are sexual (35%) and via intravenous drug use (25%). This transmission profile is largely parallel with that of HIV. In 30% of cases of persons infected with HBV, there is no identifiable historical cause or risk factor.

Hepatitis B is a potentially serious disease due to its progression to chronic hepatitis; 5—10% of cases have the risk of evolution to cirrhosis or hepatic carcinoma. The initial infection is most often asymptomatic but may evolve to fulminant hepatitis that is usually fatal (Bourdy et al., 1997; Pol, 2005). An illustration of progression of hepatitis B can be seen in Fig. 1.

Diagnosis

Following acute infection with HBV, certain persons are unable to mount an immune response that permits elimination of the virus and thus become chronic carriers of hepatitis B. A chronic carrier is one who tests positive for hepatitis B antigens more than 6 months after the acute episode. In these carriers, there are two recognised evolutive phases; the replicative phase and the non-replicative (or weakly replicative) phase. Faced with a patient who is a chronic carrier the most important

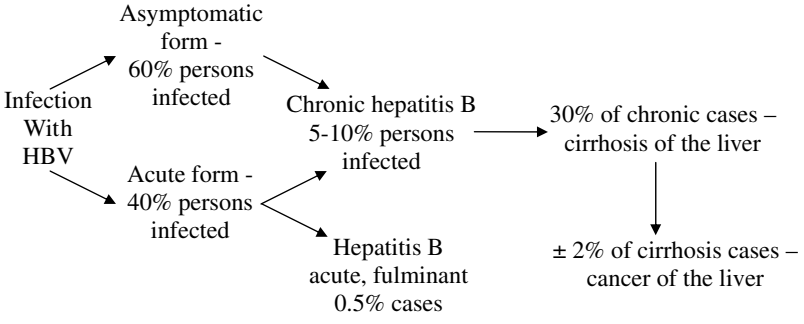

Figure 1 Progression of hepatitis B.

objective is to determine which phase he/she is in (Keeffe et al., 2004).

In the replicative phase, there is serological evidence for the hepatitis B antigen and the presence of the virus itself. Liver necrosis and inflammation are characteristic and transaminase levels are slightly or moderately elevated. Then, after several years of disease evolution, replication ceases or significantly reduces and hepatitis B antibodies appear with reduction of inflammation and normalising transaminase levels. The viral load diminishes and becomes non-measurable using normal hybridisation tests but remains detectable using other methods such as PCR.

Depending on the duration and severity of the initial replication phase (which may last several years to more than 20—30 years), in chronic carriers of HBV, we find a range of conditions from hepatic lesions, a quasi-normal liver (healthy carrier) to severe cirrhosis with serious hepatic insufficiency. It is estimated that 20% of chronic carriers evolve towards cirrhosis after 20 years of disease evolution.

Treatment

Allopathic treatment is indicated for patients with moderate or severe hepatitis B (with a Metavir score of F2, F3 or F4) and persons with hepatitis B in the replicative phase that have raised transaminase levels.

There are two types of treatment: IFN-α and pure antivirals (nucleoside analogues) lamivudine (Zeffex, Epivir) and adefovir (Hepsera) (Liaw et al., 2004; Marcellin et al., 2003). The nucleoside analogues may be used in association or separately.

The objective of treatment is to obtain a stable seroconversion with important reduction of viral replication. The therapeutic objective is not eradication of the virus but a stopping of replication.

Methodology

The objective of this work was to demonstrate antiviral and antifibrotic activity of a number of essential oils when used in monotherapy as well as to improve the efficacy of allopathic treatments and diminish side effects of bitherapy when these essential oils are used alongside conventional treatment.

Criteria for selection of patients

All patients over the age of 10 years who were non-cured carriers of hepatitis B or C without decompensated cirrhosis and with no renal insufficiency were able to benefit from aromatic treatment. This was either in monotherapy or as a complement to allopathic treatment.

Main essential oils used

The essential oils most often prescribed included ravintsara, Labrador tea, thyme ct thujanol, bay laurel, carrot, niaouli and helichrysum. They were taken orally diluted in honey, vegetable oil or within gelules. The dosage varied depending on the qualities of the individual oils. For instance, ravintsara was prescribed five drops thrice daily, laurel one drop per day and Labrador tea three drops thrice daily. Sytematically, ravintsara and Labrador tea were given together, along with a third oil that was changed every three or four months. The essential oils were generally taken during a 'therapeutic window' of one week every month. Massage was rarely used and then only if there was intolerance to the oral route. A short summary of each essential oil follows.

Ravintsara

Ravintsara (*Cinnamomum camphora* Sieb., Lauraceae) essential oil is obtained from the leaves and branches of a tree endemic to Madagascar. Its main chemical composition is represented by the oxide 1,8-cineole, monoterpene alcohols such as α-terpineol, terpinen-4-ol and terpenes such as α and β-pinene, sabinene, etc. It has traditional claims of being antiviral, immunostimulant, neurotonic, muscle decontractant and analgesic. It is most often indicated in viral infections such as influenza, infectious mononucleosis, shingles, viral hepatitis, nervous depression, fatigue, muscle fatigue and joint pains (Mishra et al., 1991; Bakkali et al., 2005).

Labrador tea

Labrador tea (*Ledum groelandicum* Retzius, Ericaceae) essential oil is obtained from the leafy branches of this Canadian plant. Its main chemical components are represented by terpenes such as the pinenes and sabinene, sesquiterpenes such as α-selinene and selinadiene and terpenic ketones such as germacrone. Its claimed properties are as a digestive stimulant, hepatic decongestant and hepatocyte regenerator, anti-inflammatory, analgesic and antispasmodic. Its traditional indications are for viral hepatitis, cirrhosis and prostatic congestion and adenoma (Bergeron et al., 1996; Idaomar et al., 2002).

Carrot
Carrot (*Daucus carota* var. *sativa* Linn., Apiaceae) essential oil is obtained from the fruits of the plant. The origin of the essential oil used was France. The principal chemical components include sesquiterpenes such as bisabolene and sesquiterpenic alcohols such as carotol and daucol. Claimed properties include hepatocellular regenerator, antibacterial, general tonic and stimulant, lowers high cholesterol and cicatrisant. Traditional indications are for hepatic and renal insufficiency and skin disorders like burns, furuncules, etc. (Kilibarda et al., 1996; Bergonzelli et al., 2003).

Laurel
Laurel (*Laurus nobilis* Linn., Lauraceae) essential oil is obtained from the leaves. Geographical origin is France and Morocco. Main chemical components include terpene alcohols such as linalol and α-terpineol, phenols such as eugenol as well as the oxide, 1,8-cineole. Claimed properties include antibacterial, antiviral, fungicidal, analgesic, anti-neuralgic, mucolytic and expectorant. Traditional indications include ear, nose and throat infections, influenza, viral hepatitis, fungal infections of the skin, gynaecological and digestive tracts (Raharivelomanana et al., 1989).

Helichrysum
Helichrysum (*Helichrysum italicum* G. Don, Asteraceae) essential oil is obtained from the flowering tops of this plant of Corsican origin. Main chemical components include neryl acetate, diones as well as sesquiterpenes such as curcumene. Its claimed properties include anti-oedematous, antispasmodic and hepato-pancreatic stimulant. Traditional indications include haematomas, phlebitis, hepatocyte insuffiency, hepatitis, cirrhosis and Dupuytrens contracture (Angioni et al., 2003).

Niaouli
Niaouli (*Melaleuca quinquenervia* S.T. Blake, Myrtaceae) essential oil is obtained from the leaves of this tree. Geographical origins include Madagascar and New Caledonia. Principal chemical components include the oxide 1,8-cineole, alcohols such as α-terpineol and terpinen-4-ol as well as sesquiterpene alcohols viridiflorol and nerolidol. Claimed properties include antibacterial, antiviral, antifungal, skin radioprotector and venous decongestant. Traditional indications include gynaecological, cutaneous and respiratory infections, viral hepatitis and prevention of radiodermatitis (Giraud-Robert, 2004).

Thyme ct thujanol
Thyme ct thujanol (*Thymus vulgaris* ct thujanol Linn., Lamiaceae) essential oil is obtained from flowering tops of this plant of French origin. Main chemical components include terpenic alcohols such as thuyan-4-ol, terpinen-4-ol and myrcen-8-ol. Claimed properties include antibacterial, antiviral, immune stimulant, hepatocyte tonic and regenerator, neurotonic. Traditional indications include gynaecological, cutaneous and respiratory infections, viral hepatitis and cirrhosis (Dorman and Deans, 2000).

Indications for aromatherapy treatment

In monotherapy

In the case of hepatitis B or C, treatment by monotherapy is indicated in the following cases.

- Patients presenting with a definitive or temporary contraindication to conventional treatment.
- Carriers of minimal hepatitis C (Metavir score of F0, F1, A0, A1) with no extra hepatic signs and if the person is not asking for treatment with IFN-α.
- Carrier of minimal hepatitis B (healthy carriers, with normal transaminases)
- Patients refusing allopathic treatment when it is indicated for their treatment (in this case the patient signs a discharge form).

In complement to allopathic treatment

Aromatherapy intervention may be used whenever allopathic treatment is indicated.

Initial workup
The initial workup is very important in order to be able to judge the efficacy or not of aromatherapy treatment, especially with regards monotherapy. It involves the following tests.

- Platelet count.
- Transaminase levels: SGOT/AST and SGPT/ALT.
- Quantitative viral load for HCV, HBV and eventually HIV if there is co-infection.
- Markers of fibrosis and viral activity (Metavir screen) by biopsy, Fibrotest or Fibroscan.
- Abdominal ultrasound.
- α-Fetoprotein and TP (if there are signs of cirrhosis).
- Complete HBV serology if there is hepatitis B.

Objective and evaluative criteria

Aromatherapy treatment in monotherapy

In both cases of hepatitis B or C, the objectives are as follows.

- Normalisation of transaminase levels if they were elevated at the start of treatment. Evaluation to be made every month during treatment.
- Reduction in viral load. Evaluation to be made every 6 months.
- Stabilisation or regression of fibrosis. Evaluation to be made by Fibrotest once a year.

In the case of hepatitis B, if the person was in the replicative phase at the start of treatment, the objective is to assist them towards the non-replicative phase (negative result for Hbe antigen). In the healthy carrier with normal transaminases, no replication of viruses and with persistence of HBs antigens, the objective is to negatively test for hepatitis B antigens and obtain seroconversion of HB antibodies. Complete serological evaluation to be made every 6 months.

Aromatherapy in complement to allopathic treatment

IFN-α and ribavirin
The objectives here are to increase the efficacy of bitherapy whilst diminishing secondary side effects.

In the treatment of hepatitis C, there exists a therapeutic rule of 80—80—80: If 80% of treatment with IFN-α and 80% of the required dose of ribavirin are able to be delivered to the patient for 80% of the required treatment duration, the cure rate rises to more than 60%. However, negative side effects of treatment that are dose dependent often necessitate a reduction of effective dose or premature stopping of treatment, thus reducing the chance of cure.

As already seen in Table 1, the side effects of treatment are significant. Important neuro-psychiatric symptoms occur in 50% of patients. They are dose dependent, fluctuating, unpredictable, individual, atypical and independent of psychiatric history. IFN-α causes a lack of dopamine and serotonin and prescription of antidepressant medication is practically systematic during treatment. Other observed problems include sleep disturbances, psychomotor agitation, reduced attention and concentration span, memory disturbance, aggression, inability to relax and suicidal tendencies.

The general state of the patient is evaluated using the Karnofsky scale. Psychological state is measured using the Hamilton scale.

In the case of bitherapy, ravinstara essential oil was used orally in complement to allopathic treatment to assist with treatment tolerance.

Hepsera-Epivir
The objectives here are to increase allopathic treatment efficacy, to reduce viral load, to achieve the non-replicative phase and to lead to negative test for the Hbe antigen if it had been present. Evaluation is based on monthly transaminase levels, viral load testing every 6 months, compete serology every 6 months and a Fibrotest once a year.

Results

This work was conducted with 60 patients that were carriers of hepatitis B or C or co-infected (HCV—HIV; HCV—HVB). Essential oils were administered orally. Their progress was followed between January 1999 and June 2005.

10 carriers of hepatitis B

This comprised of 7 women and 3 men with an average age of 40 years (12—54 years).

7 cases treated with aromatherapy monotherapy.

- One case of a healthy carrier of HBV obtained a negative test for Hbs Ag and appearance of Anti-HBs corresponding to healing within 6 months of treatment with ravintsara essential oil.
- Three cases in the replicative phase with Hbe Ag+ and Anti-HBe— whose transaminase levels were normal. In 6—9 months of treatment with ravintsara and Labrador tea, they passed to the non-replicative stage with persistence of HBV.
- Two cases in the replicative phase with elevated transaminase levels. After treatment with essential oils there was normalisation of transaminase levels and diminution of viral load.
- One case in the replicative phase with Hbe Ag+ and Anti-HBe— seroconverted to Hbe Ag— and Anti-HBe+ after one year of treatment with essential oils; two years later there was appearance of Anti-HBs and negative test for Hbs Ag. The treatment in total lasted 3 years with intermittent breaks in essential oil treatment.

Three cases treated in complement to allopathic therapy (Zeffix with or without Hepsera) With allo-

pathic treatment, the viral load was relatively stable but after aromatherapy treatment the viral load reduced significantly by a factor of 10 on average every 6 months.

50 chronic carriers of Hepatitis C

Out of these 50 persons, 35 were genotype 1; 10 were genotype 3; 2 were genotype 2; 1 was genotype 4; 2 were of unknown genotype. There were15 men, 35 women and the average age was 46 years (22—75 years).

23 patients had received or were receiving treatment with IFN-α — ribavirin or IFN-α in complement to aromatherapy treatment.

Six of these patients had already received one or more allopathic treatments with no result.

- 20 cases completed their full course of allopathic treatment. At the end of treatment, 100% of these patients had confirmed negative PCR for HCV (complete response).
- 14 patients one year later remain negative for HCV; the 6 others are not yet at the testing stage.
- Three out of the 23 patients are still under treatment.
- The tolerance to IFN-α treatment was good overall, evaluation showed 80% good tolerance, 15% medium tolerance and 5% poor tolerance.
- For patients who had previously received allopathic treatment, they stated an improved tolerance to treatment with IFN-α and ribavirin when it was associated with essential oil of ravintsara (improvement in general state and psychological state).

27 patients who had received or were receiving treatment by aromatherapy monotherapy

7 of these patients had received allopathic treatment with no response. 20 patients had not received previous allopathic treatment.

- For 2 patients the PCR of HCV become negative with one year of treatment.
- For 10 patients there was a significant reduction in viral load over several tests, a normalisation of transaminase levels and an amelioration in fibrosis.
- For 5 patients there were no significant results neither for the viral load nor transaminase levels nor fibrosis.
- For 5 patients with cirrhosis, stabilisation was achieved in 3 cases and improvement in 2 cases.
- For 5 patients whose follow up and treatment with essential oils was irregular, it was difficult to interpret the results.

In 64% of cases treated with essential oils in monotherapy, there was an improvement in hepatitis (improvement in fibrosis and/or reduction in viral load and/or negative testing). In 18% there was no amelioration in hepatitis and in 18% no conclusion was possible due to irregular treatment and follow up.

Examples of clinical cases

Chronic Hepatitis C treated with aromatherapy in monotherapy

This 70 year old patient presented in September 2000 with chronic hepatitis C. She was a non insulin dependent diabetic with repetitive urinary infections, coronary angina and retinal detachment.

In 1990, she received a blood transfusion and in 1995 hepatitis C was discovered (genotype 1.). Hepatic biopsy showed moderately active chronic hepatitis (Metavir score was not made due to poor biopsy quality). Her treatment with interferon began in 1995 for 2 months but this was stopped due to retinal detachment. In 2000, she presented for further treatment but with a contraindication to interferon treatment. Results are seen in Table 2.

Aromatic treatment began in September 2000. With this treatment we noted an antiviral activity of essential oils and a net reduction in α-Fetoprotein. Additionally we noted that the period where the viral load increased corresponded with the moment that the essential oil dose had been reduced (from three times daily to twice daily). Once the dose was raised once again to three times daily, the viral load diminished.

Treatment of a 'healthy carrier' of hepatitis B with ravinstara essential oil

This patient aged 51 came in November 1999 for treatment of his hepatitis B. He underwent a splenectomy in 1981 for a hydatid cyst. Contamination with hepatitis B was probably via a blood transfusion during a surgical procedure in 1981. Chance discovery of his disease was made in 1990 when he was screened as a blood donor. The workup at the time showed serology of a healthy carrier with normal transaminase levels, negative PCR for HBV, Hbs Ag+, Hbs Ag—, Anti-HBc+, Hbe Ag—, Anti-HBe+.

Table 2 Progression of treatment for case no. 1

Dates	Treatment EO	SGOT $N < 32$	SGPT $N < 32$	Gamma GT	Viral load — Million (M)	α-Foeto protein $N < 10$
26/09/00	Ravintsara, Lab. tea	46	76	76	56	15.89
14/11/00	Ravintsara, Lab. tea	27	45	83	—	11.9
13/03/01	Ravintsara, Lab. tea, Thyme	45	64	84	11.8	11.8
27/06/01	Ravintsara, Lab. tea	33	54	75	8.8	9.9
09/10/01	Ravintsara, Lab. tea, Laural	32	34	76	7.6	9.4
02/07/02	Ravintsara, Lab. tea, Thyme	28	43	70	2.4	9.2
25/11/02	Ravintsara, Lab. tea	32	36	66	3.6	7.2
19/04/03	Ravintsara, Lab. tea	34	63	68	—	6.8
15/05/03	Ravintsara, Lab. tea	29	47	44	0.8	6.6
25/08/03	Ravintsara, Lab. tea	36	33	59	—	—
04/11/03	Ravintsara, Lab. tea	34	38	54	—	—
09/03/04	Ravintsara, Lab. tea	36	34	48	2.3	6.5
08/11/04	Ravintsara, Lab. tea	30	32	45	1.5	6.3

Annual checkups involved transaminase levels, HBV serology and checking for Hbs Ag. For 9 years, transaminase levels remained normal but there was persistent Hbs Ag that corresponds to his diagnosis of a healthy carrier.

During consultation we also noted periods of fatigue lasting 3—4 weeks, 3—4 times per year. Aromatic treatment prescribed was ravinstara essential oil in treatments of 3 weeks per month for 6 months duration (treatment lasted from October 1999 to March 2000).

In March 2000, subsequent testing revealed the disappearance of Hbs Ag and the appearance of Anti-HBs. New results showed: Hbs Ag—, Anti-HBs+, Anti-HBc+, Hbe Ag—, Anti-HBe+. Throughout the treatment period, the patient experienced no episodes of fatigue. Since his treatment, he remains very well and has no more periods of fatigue that he had experienced previously.

Hepatitis C treated with IFN-α, ribavirin and aromatherapy

This patient aged 53 years of age came for consultation in December 1999 for her hepatitis C (genotype 1a). Antecedent history included hysterectomy. Her hepatitis C was discovered in 1997. The date of contamination probably goes back to 1993 (blood transfusion). At the beginning of 1999, faced with persistent increasing transaminase levels (SGOT at 93 and SGPT at 165), a standard treatment with IFN-α and ribavirin was proposed to the patient. This began in April 1999

Table 3 Progression of treatment for case no. 3

Dates	Treatment	SGOT $N < 32$	SGPT $N < 32$	Gamma GT	Viral load — Million
03/06/98	—	99	108	46	
15/01/99	—	93	165	49	24.5 M
04/99	Interferon, Ribavirin	—	—	—	—
14/05/99	Interferon, Ribavirin	32	35	—	—
10/08/99	Interferon, Ribavirin	21	10	14	—
09/99	Stop, Interferon, Ribavirin	—	—	—	PCR + HCV
25/10/99	—	144	254	28	—
29/12/99	Lab. tea, Helichrysum, Ravintsara	209	305	—	5.6 M
21/01/00	Lab. tea, Helichrysum, Ravintsara	52	77	—	—
22/02/00	Lab. tea, Helichrysum, Ravintsara	39	53	27	—
12/09/00	Lab. tea, Thyme, Ravintsara	33	32	17	5.7 M
07/05/01	Lab. tea, Thyme, Ravintsara	47	56	21	3.8 M
28/09/01	Lab. tea, Ravintsara	39	38	19	4.8 M
02/01/02	Interferon, PEG + Rib, Ravintsara	36	38	—	5.6 M
14/01/03	Stop, Interferon, PEG	20	16	14	PCR — HCV
18/01/04	—	22	18	18	PCR — HCV

but was stopped by the patient due to very poor tolerance (fatigue and severe depression). During the treatment, transaminase levels normalised. Once IFN-α was stopped, transaminase levels began to rise rapidly.

At the end of December 1999 the patient began treatment using Labrador tea, helichrysum and ravinstara essential oils. Results can be seen in Table 3.

In three weeks of treatment we note a net reduction in transaminase levels and her fatigue was improved in 1—2 weeks of treatment. The essential oils were effective especially with regards to normalising transaminase levels but had little efficacy on the viral load. Aromatic treatment was followed up regularly over a period of 2 years. In February 2002, a new treatment with IFN-α and ribavirin was commenced. At times, the patient used ravinstara essential oil during her allopathic treatment. This second attempt at allopathic treatment was much better tolerated than the former and ended in February 2003. The PCR of HCV was negative at the end of treatment as well as 6 months afterwards.

Discussion

Few studies have been found that link essential oils with viral hepatitis (Xiang et al., 1989; Utrilla et al., 1995; Zhang et al., 1998; Fahim, 1999; Mansour et al., 2001; Giraud-Robert, 2003; Ozbek et al., 2003;). From our work, it appears that essential oils may be working in synergy with allopathic treatment. Additionally, improved tolerance to IFN-α and ribavirin treatment was observed. An antifibrotic and antiviral effect was also found on several observations. The essential oils were selected on one hand for their potential antiviral activity and on the other for their hepatocellular regenerative activity.

The selected antiviral essential oils that were rich in high amounts of oxides (1,8-cineole), monoterpene alcohols (linalol, α-terpineol, thuyan-4-ol, etc.), and/or phenols (eugenol, methyl eugenol) included ravinstara, niaouli, thyme thujanol and laurel (the latter essential oil contains phenols and needs to be used with care due to potential hepatotoxicity). The essential oils selected for their action on the liver include Labrador tea for its decongestant and regenerative action on hepatocytes, carrot as a hepatocellular regenerator and helichrysum with hepatostimulant properties, useful in cases of hepatic insufficiency.

Conclusion

Chronic viral hepatitis diseases are frequent pathologies with variable evolution that is sometimes serious (cirrhosis, hepatic carcinoma, etc.). These clinical cases that indicate an antifibrotic and antiviral effect using essential oils has encouraged us to confirm these results with a larger number of patients and we plan to further develop research in the aromatherapy domain. Greater scientific rigour is nevertheless necessary to truly recognise the therapeutic value of these essential oils.

Key to abbreviations

HB	Hepatitis B
HC	Hepatitis C
HBV	Hepatitis B virus
HCV	Hepatitis C virus
Hbc Ag	Hepatitis B core antigen
Hbe Ag	Hepatitis B 'e' antigen
Hbs Ag	Hepatitis B surface antigen
Anti-HBs	Hepatitis B surface antibody
Anti-HBe	Hepatitis B 'e' antibody
Anti-HBc	Hepatitis B core antibody
PCR	polymerase chain reaction technique
SGOT	serum glutamic oxaloacetic transaminase
AST	aspartate transaminase
ALT	alanine transaminase
IFN-α	Interferon pegyl alpha-2a or alpha-2b

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