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What is Salvicol?

Salvicol is a compilation of high quality therapeutic ingredients blended into a formula devised by Dr Enid Taylor, the director and co-founder of The Taymount FMT Clinic and further developed by Nicola Callan ND and Annie McCue, members of the therapy team at Taymount Clinic UK.

Dr Taylor produced Salvicol to assist in improving the health and function of a diseased colon associated with irritable bowel disease (IBD) and dysbiotic conditions.

Colonic inflammatory process:

1. Increased pro-inflammatory immune infiltration.
2. Increased fibrosis formation
3. Changes in mucosal barrier integrity (leaky gut)
4. Increased colonocyte apoptosis.

Salvicol ingredients target each of these processes.

Why Salvicol?

Research is revealing the impact that both a beneficial and pathogenic microbiome have on our health. However the microbiome that exists is largely affected by the health of the mucosal lining.

A compromised mucosal lining will allow for water soluble bacterial substances and toxins to damage the underlying epithelial lining resulting in more inflammation in the gut. Irritable bowel diseases are associated with higher levels of oxidative stress at the epithelial lining (Crespo). Breaks in the barrier also increase the toxin load travelling to the liver via the portal blood stream. Recent research has linked non-alcoholic fatty liver disease with gut barrier dysfunction in the colon.

Salvicol's unique formulation contains ingredients to improve the integrity of the colonic mucosal barrier supporting both human and microbiome health, Salvicol's unique formulation also increases glutathione mucosal tissue levels, increase cell replication of healthy cells, increase cell apoptosis of unhealthy colonic cells and reduce colonic inflammation.

Early users of Salvicol have reported very good outcomes and are very much in favour of using Salvicol to help repair their internal tissues. Full patient reports are

being prepared and at this stage, we are confident that the salve does have a positive effect on outcome. One particular patient chose to stop his steroid use and has maintained a good state of health using the salve every couple of weeks since September, and he attributes his good level of non-inflammation and internal healing to the use of the salve. Initially it was envisaged that Ulcerative Colitis sufferers and IBD generally would be the ideal users of the salve but it seems that most people coming for FMT are suffering from some form of leaky gut and deficient epithelium which is helped and enhanced by the action of the salve ingredients.

Phosphatidylcholine

Salvicol's ingredients include phosphatidylcholine (PC), chosen for its ability to replace degraded phospholipids, a major component of the mucosal lining, when rectally administered (Lugea). A lack of PC results in inflammation and ulceration with studies revealing lower levels of PC in ulcerative colitis (UC) patients compared with non-UC patients.

PC increases the hydrophobic properties of the colon and protected the epithelial lining from chemical induced colitis. The colonocytes of UC patients have been discovered to be deficient in choline (Goldsmith). PC is an inhibitor of tumour necrosis factor (TNF)-alpha, a protein involved in the genesis of inflammatory cascades.

Butyrate

Butyrate has been chosen for its multiple therapeutic actions including its ability to modulate genetic expression of colonocytes increasing apoptosis in unhealthy colonocytes and increasing cell proliferation and replication of healthy colonocytes. Butyrate increases mucin production, upregulates tight junction activity thereby reducing pathogenic bacterial translocation into the portal blood stream.

Rectal administration of butyrate to irritable bowel syndrome (IBS) patients resulted in significant reduction in pain and urgency. Butyrate downregulates pro-inflammatory cytokines NFkappa-B (Leonal), Tumour Necrosis Factor (TNF)-alpha and interleukin (IL)-1beta activity (Pacheco). Transforming Growth Factor (TGF)- beta is a cytokine that induces extra-cellular remodelling in IBD's (Pacheco). TGF-beta activity is inhibited by butyrate possibly explaining butyrate's anti-fibrotic activity (Pacheco).

Butyrate and glutamine enemas administered for a period of 8 weeks resulted in improved mucosal lining integrity, reduced mucosal oedema, reduced bleeding and reduced angiogenesis associated with increased gastric epithelial bleeding in addition to reducing inflammatory markers and cell death in rats with induced colitis (Pacheco).

Glutamine

Glutamine provides both anti-inflammatory activity and increases the healing of the mucosal lining in both IBD patients and patients with chronic pouchitis thereby reducing bacterial translocation and enhancing anastomosis healing(Habibi). Glutamine suppositories given to patients twice daily with chronic pouchitis which had discontinued medical therapy resulted in a 40% relapse rate (Holubar). Studies have identified the glutamine content of the small and large intestinal mucosal lining is lower in IBD patients compared with non IBD patients (Bertrand).

Glutamine reduced nitric oxide synthase activity and cyclo-oxygenase-2 expression inhibiting inflammatory pathways which lead to a reduced apoptosis (Crespo). Increased levels of epithelial cell apoptosis is increased in Ulcerative Colitis and Crohn's patients (Crespo). Glutamine deficiency increased rat intestinal epithelial apoptosis and glutamine reduced white blood cell apoptosis in humans (Crespo).

Levels of myeloperoxidase activity were reduced in colitis induced animal models (Crespo) which may be a result of glutamines modulation of Heat Shock Protein responses and an upregulation of the endogenous antioxidant glutathione (Bertrand).

Glutamine restored levels of tumour necrosis factor(TNF)-alpha and interleukin(IL)-1beta in the colon of rats treated with colitis inducing trinitrobenzen sulfonic acid (TNBS) back to the level of non-treated control rats (Bertrand).

Glutamine reduced the formation of strictures and fibrotic tissue (Crespo) which is a characteristic of Crohn's disease (Barkas).

Salvicol comes in several forms. UC inflammation may occur in one area or the entire colon but 95% of UC pathology involves the rectum (Barkas). The suppository form allows for easy administering by the patient and concentrates the therapeutics at the main areas of inflammation. Crohn's disease more commonly effects the terminal ileum and the ascending colon at the cecum region (Barkas). Thereby the formula involving administering by catheter allows for dispersion of Salvicol further into the large intestine.

Chamomile (*Matricaria recutita*)

Chamomile provides antioxidant and anti-inflammatory activity from its constituents chamazulene, alpha-bisabolol and apigenin. Chemazulene is proposed to downregulate the inflammatory response via its effect on the adrenal glands resulting in an increase in cortisol release similar to corticosteroids (Srivastava). Bisabolol and bisabolol oxide demonstrated reduced pro-inflammatory leukotriene release through the inhibition of 5-lipoxygenase in vitro (Srivastava). Macrophages treated with chamomile in vitro resulted in reduced levels of pro-inflammatory

ecoisanoid prostaglandin (PG) E₂, a dose-dependant decrease in the expression of cyclooxygenase (COX)-2 mRNA and chamomile blocked the synthesis of PGE₂ from arachidonic acid via inhibition of the COX-2 enzyme (Srivastava).

Chamomile displayed significant reduction in total WBC and lymphocyte count in colitis induced rabbits with results significantly comparable to Mesalazine. The Both Chamomile and Mesalazine treated group showed no ulceration, reduction in inflammation and an increase in serum electrolyte levels (Abdul-Amir Sabeeh Al - Hussaini, Jinan). **Electrolyte imbalance is common in UC patients.**

Chamomile has demonstrated protective activity against ulcer formation in several studies including protection against mucosal erosion (Karbalay-Doust, Al-Hashem) and inhibition of haemorrhage of damaged tissues significantly similar to pharmaceutical Sucralfate (Karbalay-Doust). The administering of Chamomile in a dose dependant manner protected against mucosal lining histopathological changes in rats induced with a gastric ulcer (Al-Hashem). GSH mucosal tissue levels were increased in the rats receiving the Chamomile, which may explain the increase in GSH tissue levels due to the abundance of antioxidant compounds in Chamomile (Al-Hashem)

Frankincense (*Boswellia papyrifera*)

Frankincense is long-associated with uses in skin care and preparations made for various skin conditions, and including use for relief from stings such as scorpion stings. For this reason, it has been included to assist with relief from lesions and skin interruptions in the epithelial layer and to assist with healing and generation of new skin cells.

For therapy trials in ulcerative colitis, asthma and rheumatoid arthritis there are only isolated reports and pilot studies from which there is not yet sufficient evidence of safety and efficacy. Similarly, the long-term effects and side effects of taking frankincense has not yet been scientifically investigated. Nonetheless, several preliminary studies have been published indicating safety for internal use.

A 2008 study reported that frankincense smoke was a psychoactive drug that relieves depression and anxiety in mice. The researchers found that the chemical compound *incensole acetate* was responsible for the effects.

In a different study, an enriched extract of "Indian Frankincense" (usually *Boswellia serrata*) was used in a randomized, double-blinded, placebo-controlled study of patients with osteoarthritis. Patients receiving the extract showed significant improvement in their arthritis in as little as seven days. The compound caused no major adverse effects and, according to the study authors, is safe for human consumption and long-term use.

In a study published in 2009, it was reported that "Frankincense oil appears to distinguish cancerous from normal bladder cells and suppress cancer cell viability."

Given the existing research supporting the safety of using Frankincense in preparations aimed at internal use, the inclusion of this material was guided by naturopathic and herbal practices and experience.

Vitamin E oil

Coconut Oil

Emu Oil (still under investigation for suitability for the formula)

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