

Complementary therapies: your questions answered

Use of pineapple for induction of labour



Denise Tiran investigates whether the tropical fruit and its relatives really can help women to avoid medical intervention

Several midwives have asked recently about women's consumption of pineapple as a self-help means of inducing labour naturally, in order to avoid medical management of post-dates pregnancy. This seems to have become one of the current "hot topics" among women – but should midwives advise on, or support mothers' wishes to, ingest pineapple to initiate contractions?

Pineapple (Latin - *Ananas ananas*), which contains bromelain, is part of the Bromeliaceae family. Traditionally, pineapple has long been used in some cultures for post-traumatic inflammation and swelling, including respiratory sinus congestion and allergic rhinitis. More recently, bromelain has been taken to enhance the absorption of antibiotics and to prevent the pulmonary oedema that can occur in conjunction with epinephrine use (Maurer 2001). Bromelain is thought to increase fat excretion (although the high glycaemic index of pineapple probably precludes its use as a dietary aid). It is also used as a preventative measure against some cancers, for which there is growing evidence of efficacy (Hale et al 2002), and is sometimes used in combination with trypsin and rutin, as an analgesic agent for osteoarthritis (Klein and Kullich 2000). It is also taken orally both as a smooth muscle relaxant in certain circumstances, eg ulcerative colitis (Kane and Goldberg 2000) and, conversely, to stimulate muscular contractions, especially as a means of shortening labour.

Evidence

The stem and fruit of the pineapple are known to contain sulphuric proteolytic enzymes (collectively termed bromelain), the chemical constituents of which inhibit platelet aggregation and have a fibrinolytic action, which may be partly responsible for the anti-cancer properties (Gläser and Hilberg 2006). The anti-inflammatory

effects may be due to changes in leucocyte activity, although it is considered that these effects may be confined to the gastrointestinal tract (Hale et al 2002). Systemically, bromelain may be inactivated by the protein inhibitors present in plasma (Taussig and Batkin 1988) and there is some suggestion that, rather than stimulating cervical prostaglandins, bromelain may actually reduce the levels (Gaspani et al 2002).

A literature search found several old papers suggesting that bromelain may have a positive impact on breast engorgement, although Snowden et al (2001) found only that bromelain may be effective when used in combination with trypsin. No research evidence could be found on the effectiveness of bromelain to induce uterine contractions, although numerous pregnancy websites mention it, mostly without any precautions being identified. Some consumer websites suggest that its effects on labour are due to a direct cervical action but no evidence for this could be found.

Side-effects

Bromelain is only present in fresh pineapple as the enzymes are destroyed in the canning process. In addition the highest proportion of bromelain is found in the stem and core of the fruit, so it is not appropriate to remove the core before eating. Indeed, in order to obtain sufficient bromelain to have any real therapeutic effects on labour, a mother would need to eat at least seven or eight whole pineapples! This is more likely to cause diarrhoea than to trigger contractions, although this in itself may stimulate local neural pathways, indirectly contributing to labour onset.

Other side-effects include allergic reactions in women known to be allergic to pineapple, but there is also a risk of cross-sensitivity between bromelain and wheat flour, celery, papain (found in papaya),

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carrots, fennel, cypress and grass pollen (Nettis et al 2001). Women who are sensitive to any of these substances, as well as those allergic to plants such as chrysanthemums, marigolds, daisies and echinacea, should avoid eating pineapple (Nettis et al 2001). Mothers on anticoagulants, or other drugs with similar actions, as well as anticoagulant herbal products, including angelica, aniseed, arnica, celery, chamomile, clove, fenugreek, feverfew, garlic, ginger, horse chestnut, licorice, meadowsweet, potato, red clover, soybean and willow should avoid pineapple and other bromelain-containing plants such as papaya and mango (Bush et al 2007). There is also a reasonable risk of interaction between bromelain and amoxicillin and tetracycline (Bush et al 2007). Women should also refrain from ingesting pineapple for at least two weeks prior to elective surgery, due to the anti-coagulant effects.

Papaya and mango

Other bromelain-containing fruits include papaya and mango, although no information could be found in the therapeutic actions of mango. Papaya contains also papain and carpain, which may not be safe during early pregnancy, due to possible teratogenic and embryotoxic effects (Shaw et al 1997), although this might be due to other constituents rather than papain. Papain is unstable in digestive juices, which suggests that it may not be effective when taken orally. Carpain is thought to cause bradycardia or have central nervous system depressant or paralytic effects (Shaw et al 1997). Severe allergic reactions can occur in women

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sensitive to papain, especially those allergic to latex (Blanco et al 1999), and ingestion of large amounts may cause oesophageal perforation. Papaya should not be eaten in large quantities by women on anticoagulants, as it has been shown to potentiate the effects of warfarin (Shaw et al 1997).

Be cautious

Mothers will try anything which may help them to avoid medical induction of labour simply because they are past their estimated date of delivery, but no natural substance is without some risk. Midwives should be cautious and alert women to the potential risks, giving them sufficient information to enable them to make a considered decision for themselves. Whilst little harm will come to most women in good health and with normal pregnancies who choose to eat large quantities of pineapple, those with medical conditions, especially those on potent antibiotics or anticoagulants, should be advised to avoid pineapple or papaya. Furthermore, midwives should try to make women aware of the fact that any intervention, even those which are natural, may be inappropriate and can lead to the cascade of intervention sometimes seen with medically-prescribed oxytocin administration. **TPM**

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References

- Blanco C, Diaz-Perales A, Collada C, et al (1999). 'Class I chitinases as potential panallergens involved in the latex-fruit syndrome'. *J Allergy Clin Immunol*, 103(3 Pt 1): 507-13.
- Bush TM, Rayburn KS, Holloway SW, et al (2007). 'Adverse interactions between herbal and dietary substances and prescription medications: a clinical survey'. *Altern Ther Health Med*, 13: 30-5.
- Gaspani L, Limioli E, Ferrario P, Bianchi M (2002). 'In vivo and in vitro effects of bromelain on PGE(2) and SP concentrations in the inflammatory exudate in rats'. *Pharmacology*, 65(2): 83-6.
- Gläser D, Hilberg T (2006). 'The influence of bromelain on platelet count and platelet activity in vitro'. *Platelets*, 17 (1): 37-41.
- Hale LP, Greer PK, Sempowski GD (2002). 'Bromelain treatment alters leukocyte expression of cell surface molecules involved in cellular adhesion and activation'. *Clin Immunol*, 104:183-90.
- Kane S, Goldberg MJ (2000). 'Use of bromelain for mild ulcerative colitis'. *Ann Intern Med*, 132:680.
- Klein G, Kullich W (2000). 'Short-term treatment of painful osteoarthritis of the knee with oral enzymes'. *Clin Drug Invest*, 19:15-23.
- Maurer HR (2001). 'Bromelain: biochemistry, pharmacology and medical use'. *Cell Mol Life Sci*, 58(9):1234-45.
- Nettis E, Napoli G, Ferrannini A, Tursi A (2001). 'IgE-mediated allergy to bromelain'. *Allergy*, 56:257-8.
- Shaw D, Leon C, Kolev S, Murray V (1997). 'Traditional remedies and food supplements: a 5-year toxicological study (1991-1995)'. *Drug Safety*, 17:342-56.
- Snowden HM, Renfrew MJ, Woolridge MW (2001). 'Treatments for breast engorgement during lactation'. *Cochrane Database Syst Rev* 2001;(2):CD000046.
- Taussig SJ, Batkin S (1988). 'Bromelain, the enzyme complex of pineapple (*Ananas comosus*) and its clinical application. An update'. *J Ethnopharmacol*, 22(2):191-20322:191-203.

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