AIMS For a better birth...

Am I more likely to need a caesarean if my labour is induced?

Please note that this page is awaiting update

One concern many people have about having their labour induced is that it might increase their chance of having a caesarean. Reasons for this could be that induction puts a baby under more stress, or because the induction fails to progress to the birth of the baby within a reasonable time.

The research evidence about the impact of induction on caesarean rates is contradictory and has been much debated by experts. In formal **randomised controlled trials** (RCT) it looks as though induction does not significantly increase the chances of having a caesarean, but **population studies** suggest that in real life it's likely that it does. For an explanation of these different types of research see 'Understanding Research Evidence'

Below we explore what some of the reasons behind this might be.

What evidence is there that induction might reduce your chance of a caesarean?

RCTs (which compare two groups who have been randomly allocated to have different treatments) often find that induction makes no difference or reduces the chance of a caesarean. For example, a recent study combined the results of many RCTs of induction at term, 40 weeks or beyond[1]. It concluded that there were slightly fewer caesareans amongst the women who were randomised to be induced. The figures were around 15 fewer caesareans, but 13 more births assisted with forceps or ventouse for every 1000 women in the induction group, compared to those randomised to expectant management (waiting for labour to start).

Issues with this type of research

In the review discussed above, the findings are dominated by one large study of induction for length of pregnancy beyond 41 weeks (the Hannah trial)[2]. This study has been criticised for several reasons[3] which are also likely to apply to a greater or lesser extent to other RCTs, so we will use this as an illustration.

- **Cross over**

RCTs report their findings by what is called 'intention to treat'. This means that if a woman was randomly allocated to have her labour induced, she will be counted in the induction group whether she actually had

an induction or went into spontaneous labour before the planned induction. Similarly, a woman who was randomly allocated to wait for her labour to start spontaneously (called 'expectant management') will be counted in that group even if she later went on to be induced for some other reason. The random allocation is done to try to ensure that the groups are as similar as possible, so that differences between them do not affect the results. Analysis by 'intention to treat' is designed to avoid ending up with groups that are not similar, which could happen if the people who do not get their intended treatment are different in some way from the rest of their group.

This approach give good results providing the 'cross over' (the proportion who had the treatment they were not intended to) remains small, but not when the cross over is large. In that case, it is desirable to also do the analysis based on the treatment actually received (induction or not). Another way to look at this is that 'intention to treat' shows whether *planning* an induction makes a difference to the chances of having a caesarean, rather than whether *having* an induction does.

The Hannah trial found that 21.2% of women who were in the induction group and 24.5% in the expectant management group had a caesarean . What these figures don't show is that over a third of the expectant management group had their labours induced. Also around a third of the induction group went into labour spontaneously or had a caesarean before they were induced. So, more than 1 in 3 women allocated to *not* be induced *were* induced and nearly 1 in 3 women allocated to *be* induced were *not* induced.

It would therefore have been more useful if the authors had also compared caesarean rates in all the women who had their labours induced and all those who laboured spontaneously, in order to see whether induction at 41 weeks alters the caesarean rate, or has any other benefits or risks.

- **Difference in methods of induction**

An RCT can only produce valid findings if the two groups differ only in the treatment of intervention being tested, in this case whether labour is induced at a specified numberof weeks of pregnancy compared to waiting for spontaneous labour. Also, those in the expectant management group who do go on to have their labours induced need to be treated using the same methods as those in the planned induction group. In the Hannah trial women in the induction group were given prostaglandin if their cervix was not already dilated to 3cm or more. Those in the expectant management group who had induction went straight to having their waters broken or a Syntocinon drip, and this may have made it less likely that the induction would be successful, and so more likely that the baby would be born by caesarean. As the authors of the study say *"One can only speculate about what the results would have been if prostaglandin gel had been used for women in the monitoring group or for all women who had evidence of fetal compromise"*.

- **Lack of blinding and observer bias.**

Ideally in an RCT those providing and receiving treatment are not able to tell which group they are in,

which is refer to as blinding. In studies of induction blinding is not possible - women and their carers inevitably know which group they are in. If women, midwives and doctors believe that pregnancy carries an increasing risk to the baby the longer it goes on beyond 41 weeks this could affect their decision-making. It has been questioned whether this made the people in these studies more ready to request or offer a caesarean if labour has not begun by 41 weeks, or if an induction was tried for some reason and failed to bring on labour quickly. As the authors of the Hannah study say *"Because our trial did not use blinding, the differences in the rates of cesarean section may have been due to differences in the interpretation of fetal heart-rate tracings."*

It's also quite likely that there is 'observer bias' with doctors involved responded differently to any worrying signs either before or during labour depending on whether the mother is having induction or expectant management. Something that they might egard as insignificant in the induction group might lead them to suggest a caesarean to a woman in the expectant management group simply because of their own belief that a longer pregnancy puts these babies at higher risk. As the authors of the Hannah study say *"A physician may be more likely to perform a cesarean section at 43 weeks of gestation than at 41 weeks, or when labor has been induced."*

- **Abnormally high caesarean rates**

RCTs looking at the effect of induction often seem to find caesarean rates for both induction and expectant management groups which are well above what would normally be expected, which casts doubt on the relevance of the findings. For example, a recent study of induction at 39 weeks in women aged 35 or over (the so-called "35/39 trial")[4] reported no difference in caesarean rates, but the figures were 32% for the induction group and 33% for the expectant management group. These are extraordinarily high rates for first-time mothers with no known pregnancy complications[5]. The National Maternity Statistics for England in 2017-18[6] showed an unplanned caesarean rate for first-time mothers of 21% and that is including mothers who had known complications.

A recent randomised controlled trial in the USA which compared induction at 39 weeks with expectant management for first time mothers who had no risk factors (the ARRIVE trial)[7] found a slightly lower rate of caesareans in the induction group (19% vs 22%). These again are high ceasarean rates for a group of first time mothers who were considered to be at low risk. There are many unanswered questions about this trial. In particular it is not clear how many women in the expectant management group actually had their labours induced, but there is reason to think that *"a large percentage of women in the expectant-management group underwent unnecessary induction with an unfavorable cervix"* which would have increased the chances of them needing a caesarean[8]

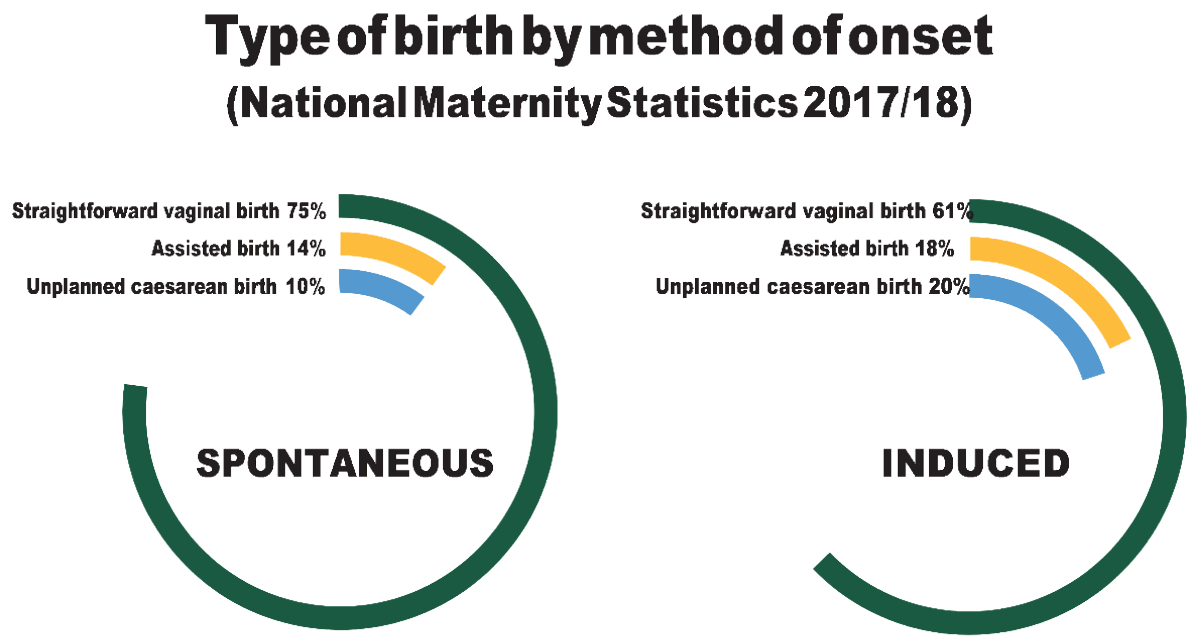
What evidence is there that induction might increase your chance of a caesarean?

In contrast, numerous population studies, which look back at what happened in a large group of mothers, have reported *higher* caesarean rates when labour is induced. These studies typically show the caesarean

rate to be twice as high when labour is induced.[9,10,11,12]

Part of the problem may be that if an induction is done when a mother is not ready to go into labour the process is more likely to fail or cause the baby to become distressed. These factors would make a caesarean more likely. One study[9] found that after adjusting for how close mothers were to going into labour there was no difference in caesarean rates with or without induction. This was probably because induction is more likely to work if the mother is already close to going into labour. In that situation, it's worth asking whether the induction is really needed.

The National Maternity Statistics for England in 2017-18[6] show that when labour started spontaneously, 75% of mothers had a straightforward vaginal birth, but when labour was induced only 61% of mothers did so. Also, the women who had an induced labour were twice as likely to have an unplanned caesarean as those whose labours started spontaneously. We can't be certain why this is, as the statistics do not include the reasons for induction, or caesarean. However, failure of the induction or distress to the baby as a result of the induction are likely to be factors.



Source: NHS Digital

Does simply planning an induction increase the chance of a caesarean?

Inducing labour means giving birth in a hospital consultant unit. There is good evidence that planning to birth at home or in a birth centre significantly reduces the chance of a caesarean from16% to 7-9%13 Agreeing to induction will therefore increase the risk of having an unplanned caesarean compared with planning to birth in an out-of-hospital setting just because of the 'being in hospital' factor.

RCTs will not have been able to account for this difference in caesarean rates as all women agreeing to be included in a study will have been expected to birth in hospital, and this may also have contributed to the high caesarean rates.

In summary the research evidence about the impact of induction on caesarean rates is contradictory and has been much debated by experts. In formal RCTs it looks as though induction does not significantly increase the chances of having a caesarean, but population studies suggest that in real life it's likely that it does.

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