

Efficient, Simple and Inexpensive Program for Prevention of Very Early Prematurity

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Infants who are born prematurely (< 37+0 gw) and/or have a low birthweight (< 2500g) suffer a higher risk of mortality and morbidity. Particularly those infants are at considerable risk, who are born very prematurely with less than 32+0 gw and those whose birthweight is very low, less than 1500g. Although in industrial countries neonatologists have achieved enormous success in keeping extremely premature infants alive, mortality increases rapidly with decreasing birthweight. The immediate and longterm sequelae of prematurity are also alarming (1, 2, 8-10) - something which is sometimes neglected when just measuring the "successes" of modern intensive care by mortality rates.

Also the general financial expense is enormous. Lewit and cow. (6) estimated that in 1988 in the USA each year the costs of medical care, child care and education for the 3.5 - 4 million children aged up to 15 years, who had been born with low birthweight, were between 5.5 and 6 billion (US)-Dollars more than they would have been if those children had been born with normal birthweight.

Causes of late abortion and prematurity

A large number of reasons are known to cause late abortions and prematurity. Lockwood and Kuczynski (7) divided most of the known causes of prematurity into four pathogenetic processes:

- activation of the maternal or fetal hypothalamic-pituitary-adrenal (HPA) axis
- decidual-chorioamniotic or systemic inflammation
- decidual hemorrhage
- pathological distension of the uterus.

Infection is the main cause of preventable prematurity

As far as the avoidable causes are concerned, infections play the main role: ascending genital infection is known to be the main source - particularly of premature births below 32+0 gw. Back in 1991 (11, 12) we were able to find concrete signs of an infection in about three quarters of the infants with a birthweight of less than 2000g. The amount of cases with premature rupture of membranes, was correspondingly high, namely 55%. The association between bacterial vaginosis and prematurity is particularly remarkable. Maternal urinary tract infections or systemic infections can however, also lead to premature birth.

Prematurity is increasingly preventable

There is a common saying: "prevention is better than cure". Therefore,

- the best is screening for causes that may lead to prematurity and to treat them as early as possible, rather than
- looking for and treating symptoms that indicate the threat of prematurity, which are already present;
- the poorest solution is the treatment of extremely premature infants with modern intensive care.

Our prematurity-prevention-program

After having been engaged in this field for 30 years, in 1989 we developed a new prematurity-prevention-program. The original part with its 4 stages is intended for physicians. Considering the allotted space for this contribution, it is not possible to go into the details, but this whole concept has been published repeatedly (11, 12, 15). Detailed information about the program is also on our website (s. authors' address) The main emphasis of our program lays in screening each pregnant woman

for pre-infection signs - or if this has been started too late, for infection signs - because disturbances of the vaginal milieu and infections can be treated more successfully if they are diagnosed at a very early stage. In cases of other prematurity causes, the possibility of intervention and successful therapy is clearly not so good.

The measurement of the vaginal pH-value is particularly important. An increase in the pH-value can refer to

- a disturbance in the vaginal milieu, the so called "dysbiosis",
- a bacterial vaginosis and more rarely to
- another infection.

If other infections are suspected, an appropriate examination should be carried out.

The treatment will be performed according to the situation (15). Here are just the most common indications:

- Disturbances of the vaginal milieu without signs of bacterial vaginosis or specific infection: lactobacillus preparations provide the best treatment in these cases.
- If bacterial vaginosis is diagnosed it should be treated either locally or systemically with Metronidazole or Clindamycin.
- Specific infections should be treated accordingly.

Self-care-program

The most important part of our prematurity-prevention-program is the "self-care-program for pregnant patients" which we developed in 1993 as an additional measure (13, 15). Within this self-care-program we recommend that all pregnant patients take an active part, particularly by measuring their own vaginal pH twice a week. They should start as early as possible, at best immediately after pregnancy has been diagnosed.

We recommend to measure the vaginal pH using a CarePlan,VpH-test-glove which we developed in collaboration with the Inverness Medical (Europe) Company; the present distributor is Unipath (Cologne/Germany). The indicator can be compared with a color chart and the pH-value read. If the pH is normal, this means 4.4 or less, the indicator turns yellow. The test-glove packs also contain detailed information about the program for the women. It is also possible to measure the pH with the pH-indicator-strips form Merck Company

(Art. No. 1.09542) which have the same indicator field. The strips are cheaper, but do not contain any information which should therefore be supplied.

If the pH is measured twice a week by the patient herself the intervals between measurements are greatly reduced to one eighths compared with the common prenatal care examination once every four weeks by the physician. The apparent chances of very early detection of risk symptoms are substantially superior when the patient measures her pH herself. If a pH-value of 4.7 or more is measured, the pregnant patient is advised to consult her doctor as soon as possible to ascertain the background, and if necessary start treatment.

Other important potential risk factors which can be detected by the patient herself are listed in the information brochure (15). They are advised to get in touch with their doctor immediately if any of these signs are present:

- changes in vaginal discharge,
- burning and itching in the intimate regions,
- signs of urinary tract infection,
- menstruation-like pains etc.
- vaginal bleeding or spotting.

RESULTS

Our results have repeatedly been published (11-14) Just a few results concerning the self-care-program should be mentioned. The self-care-program has been in use since September 1993. The rate of low birthweight infants (<2500g) in those patients taking part in the self-care-program and who had been pregnant before was 6.2%, this means three times less than in immediate previous pregnancies, when it had been 18.3%. It is of special interest to note that the number of very underweight infants (<1500g) was 1.3%, that is six times lower than in the immediate previous pregnancies, when it had been 7.8%. The rate of extremely underweight infants (<1000g) amounted to 0.9%, as opposed to 3.9% previously.

Results from other places: Later Hoyme and cow. (3, 4) achieved similar encouraging results with our program in a prospective project undertaken in Erfurt, the capital of Thuringia, Germany. The excellent results encouraged the Government of Thuringia to employ our program on approval in their whole state. In the second half of the year 2000 the self-care-program was employed and the statistically evaluated results for the entire state were compared with those from the first half of 2000 without the program. The results are impressive and - from our point of view - represent a breakthrough, in as far as most authors dealing with prematurity up to now have stated that in greater population areas the prematurity rate has not

changed at all during the last decades. In Thuringia the results were (5):

- With regard to gestational weeks: the rate of very early born infants with less than 32 gw was 1.58% in the first half of the year 2000, and 0.99% in the second half. This is a significant reduction.
- With regard to birthweight: in infants below 1500g birthweight the rate decreased from 1.29% to 0.97%. In infants with less than 1000g the decrease was significant from 0.61% to 0.38%. This is an even greater decrease.

Conclusion and short critical comment

Currently the self-care-program as has been confirmed by our evaluation and afterwards by two prospective investigations by Hoyme and co. seems to be the most efficient, inexpensive and easily applicable program for prevention of very early prematurity.

But this program is by far not used enough. From our point of view there are a few barriers. In the foreground we see a an iatrogenic barrier, namely a misjudgment of the practical benefit of different strategies for prematurity prevention on a broad scale. From our point of view unfortunately too many of our colleagues concentrate too much on highly sophisticated methods such as ultrasonographic diagnostics, immunobiologic examinations such as cytokines or fetal fibronectin and others. Such diagnostics are of course also important but are mostly concerned with the late stages of the prematurity process and can therefore never be as efficient as our simple, inexpensive and much earlier employed prematurity-prevention program. As far as we know up to now there is no study existing which could convincingly demonstrate that the prematurity rate has been significantly decreased throughout the country only by the use of such methods.

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