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Case Report
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Effects of Polyphenols on Premature Fetal Ductal Constriction

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Case Report

Polyphenols are bioactive compounds with antioxidant properties found in plants and plant-derived products, including commonly consumed foods and beverages. In general terms, polyphenols are beneficial to humans and can be found in many consumed products such as: berries, dark chocolate, beans, nuts, soy, among others. It has been found, however, that the excess of consumption of polyphenols by pregnant women can have a negative effect on the fetus. Specifically, women who consumed a great number of polyphenols have been found to have a premature restriction of the ductus arteriosus of the fetus. This can cause serious issues to the unborn baby as premature closure of the ductus arteriosus may result in volume overload on the fetal pulmonary circulation, eventually leading to persistent pulmonary hypertension and, in extreme cases, fetal death. We saw three pregnant women who came for a third trimester fetal echocardiogram. We found that in addition to turbulent flow in the ductus the three fetuses had cardiac chamber disproportion, specifically, enlargement of the right atrium and right ventricle, at least mild tricuspid and pulmonary valve regurgitation and increased diameter of the proximal right and left pulmonary arteries [1] (Figure 1).

Further common echocardiography measurements found on all three fetuses included increased systolic velocity in the ductus with a range of 0.9 cm/s to 1.3 m/s and a reduced pulsatility index. While explaining the findings to the three pregnant women and asking them about their diet and consumption habits, it was found that all three had consumed great amounts of foods rich in polyphenols. Two of the women's main cravings included strawberries and they had them almost every day for several weeks. The other woman's main craving was dark chocolate, and this was also consumed almost daily for several weeks. In a two week follow up visit after limiting the consumption of polyphenols, it was found that all three fetuses showed decreased systolic velocity in the ductus between 0.7 cm/s- 0.9 cm/s and a slight increase in the pulsatility index [2]. The size of the right atrium and right ventricle and the amount of tricuspid and pulmonary regurgitation did not change (Figure 2). Even though our observation is limited to three pregnant women, we can conclude that there is a direct relationship between the excess of consumption of foods rich in polyphenols and the velocity of systolic flow in the fetal ductus arteriosus and an inverse relationship between the consumption of foods rich in polyphenols and the pulsatility index [3] (Figure 3). Further studies must be performed using a larger sample to determine if this relationship is also valid for a larger population of pregnant women whose fetuses are found to show premature constriction of the ductus arteriosus in the third trimester due to significant consumption of foods containing polyphenols.

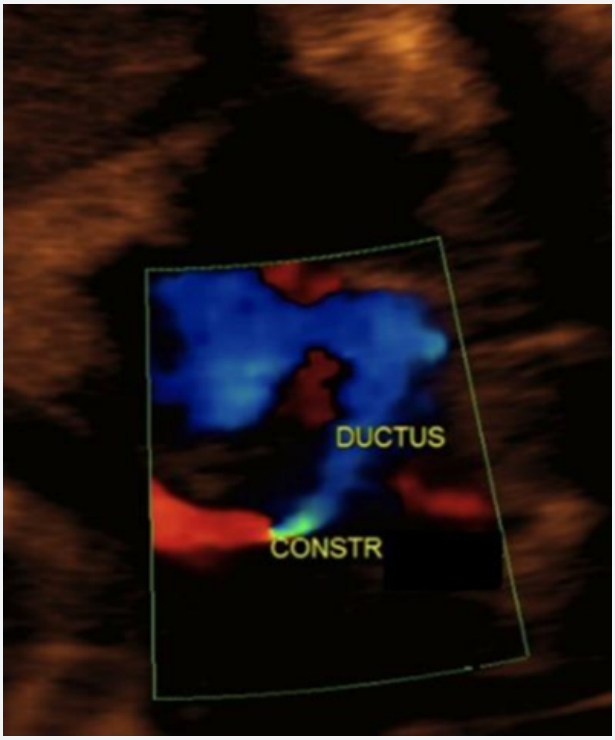

Figure 1: This image shows turbulent flow in the ductus which was seen in all three pregnant women as well as cardiac chamber disproportion.

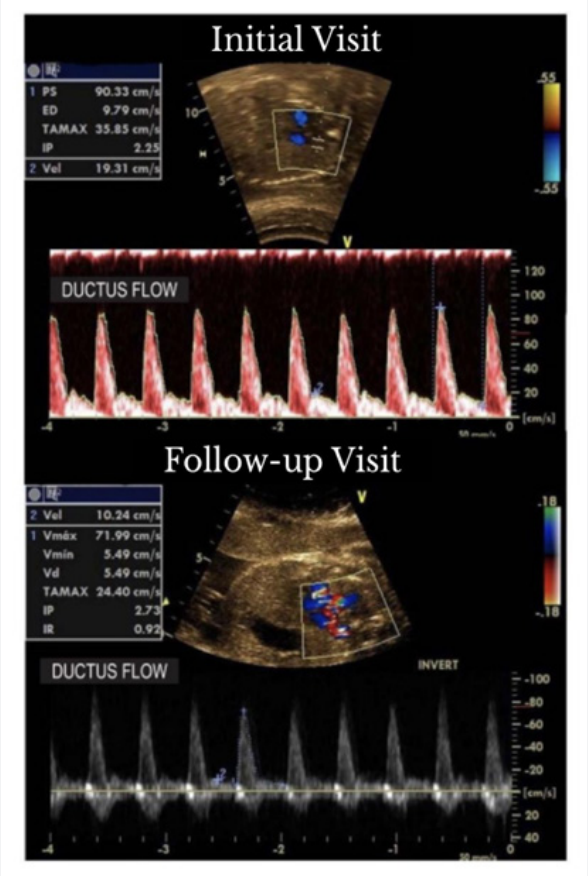

Figure 2: This image shows changes in the Doppler velocities and pulsatility index from the initial visit to the follow up visit.

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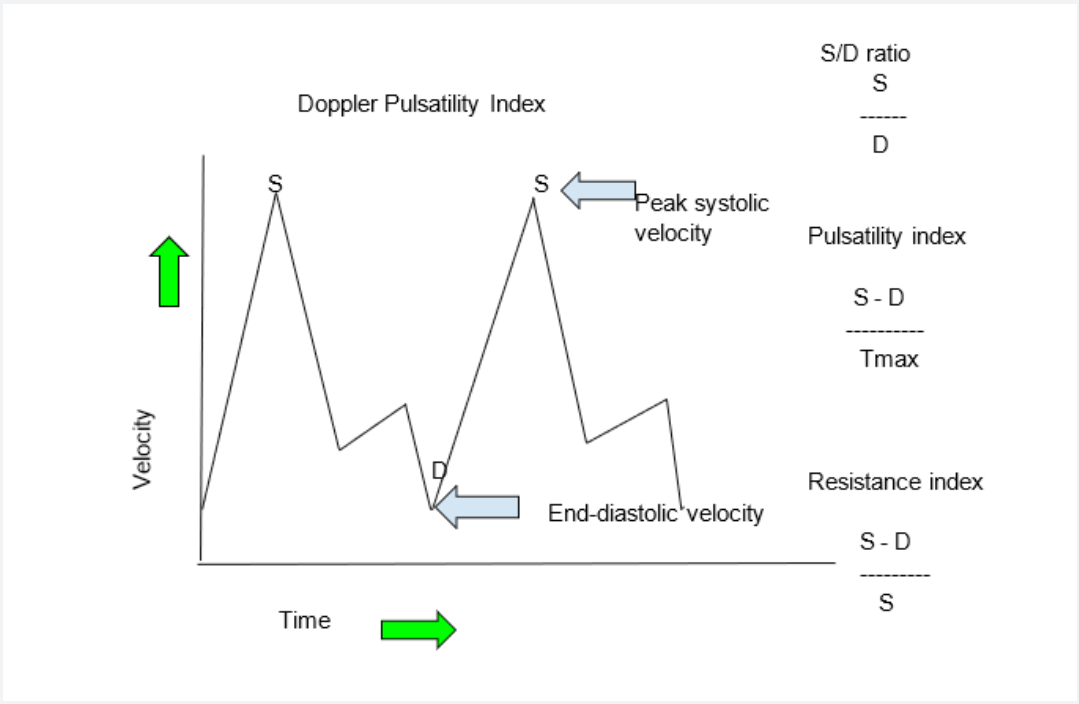

Figure 3: Doppler Pulsatility Index.

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