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Telemedicine and fetal ultrasonography in a remote Newfoundland community


The Society of Obstetricians and Gynaecologists of Canada (SOGC) recommends that all pregnant women undergo a second trimester ultrasound scan for the evaluation of dating, biometry and malformation. For women in rural areas this requires a substantial time loss, inconvenience, cost and effort to travel to a large medical centre for this service.

The present study was undertaken to evaluate the efficacy and reliability of teleobstetric ultrasonography services from an urban tertiary care centre to a remote hospital in a timely and cost-effective manner. Forty-nine women from a remote community in Newfoundland underwent 2 screening obstetric ultrasound examinations. The first was performed at the local hospital by a trained technologist, supervised by a radiologist at the Health Sciences Centre in St. John’s (experimental group), using an AVP Pacspro Teleradiology System comprising of 2 personal computers (486 DX 33 MHz) linked via 19.2-kbit/s modem over a single analog telephone line. For the second examination, the women travelled about 200 km to a regional hospital and had an ultrasound examination performed under the direct supervision of a radiologist (control group). The radiologists in both groups were blinded to each other’s reports.

The mean interval between the 2 ultrasound examinations was 8 days. The mean gestational age, as estimated by measurement of the biparietal diameter, did not differ significantly between the experimental and control groups (21.27 and 21.35 weeks respectively). The r value between the 2 groups was 0.979 (p < 0.001). Four abnormalities — placenta previa, nonviable gestation, corpus luteum cyst and placental venous lake — were detected and reported identically on both examinations; on the first examination, these patients were informed of the results and immediately referred to the specialist at the regional hospital, where repeat examinations were performed and their results included in the study. The technical quality of the transmitted images was reported as excellent. The teleradiology system shortened the time it took for patients to be informed of their examination results (1 week on average for the control group versus the same day for the teleradiology group).

Teleradiology has been studied for at least 30 years as a possible way to improve expert consultation on radiographs taken in remote locations. Landwehr and colleagues found that telesonography was a clinically useful tool for remote interpretation of fetal ultrasonography examinations. Malone and associates, by using satellite transmission of images and an integrated services digital network, reported that the interpretation of obstetric ultrasonography with the use of live video telemedicine is compatible to videotape review. However, high-speed communication lines are expensive, and there is a lack of digital telecommunication services in most rural areas of Canada. Providing high-speed lines to rural and remote areas may not be cost-effective. The use of conventional analog telephone lines for data transmission may be more practical.

Our findings indicate that teleobstetric ultrasonography services using conventional analog telephone lines can be provided to a remote hospital from an urban tertiary care centre in a reliable and timely manner. To some extent such services may help to alleviate the problem of recruiting and retaining specialists in rural areas.

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