

Fetal monitor calibration among public hospitals in Indonesia

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Abstrak

Latar belakang: Kalibrasi berkala alat diagnostik termasuk di rumah sakit (RS) sangat penting untuk diagnosis yang akurat. Riset fasilitas kesehatan (Rifaskes) 2011 di RS di Indonesia mengumpulkan data termasuk kalibrasi monitor janin. Tujuan analisis ialah untuk mengidentifikasi faktor dominan terhadap kalibrasi berkala monitor janin di RS.

Metode: Analisis data memakai sebagian data Rifaskes 2011 di antara RS yang mempunyai monitor janin. Untuk mengidentifikasi faktor dominan terhadap RS yang melakukan kalibrasi tepat waktu dibandingkan dengan yang tidak melakukan kalibrasi monitor janin digunakan pendekatan risiko relatif.

Hasil: Dari 297 RS yang memenuhi kriteria inklusi yang memiliki monitor janin, sebanyak 82 RS (27,6%) melakukan kalibrasi monitor tepat waktu, dan 132 RS tidak melakukan kalibrasi. Rumah sakit terakreditasi dibandingkan dengan RS tidak terakreditasi lebih banyak yang melakukan kalibrasi monitor janin. Dibandingkan dengan RS yang tidak terakreditasi, RS yang terakreditasi untuk 5 pelayanan, untuk 12 pelayanan, dan 16 pelayanan berpeluang masing-masing 2,2 kali lipat, 2 kali lipat, dan 3,4 kali lipat untuk melakukan kalibrasi tepat waktu monitor janin.

Kesimpulan: Rumah sakit yang terakreditasi dibandingkan dengan RS tidak terakreditasi lebih banyak yang melakukan tepat waktu kalibrasi monitor janin. (*Health Science Indones 2013;1:7-10*)

Kata kunci: kalibrasi, monitor janin, rumah sakit

Abstract

Background: Periodic calibration for diagnostic tool in hospitals is essential for accurate diagnosis. The purpose of analysis was to identify the dominant factors related to implementation of periodic calibration of the fetal monitor in the hospitals.

Methods: Analysis data using a part of Rifaskes 2011 data among selected hospitals in Indonesia which had fetal monitors. To identify the dominant factors related to fetal monitor on time calibration compared with not doing calibration fetal monitor we used relative risk approach.

Results: Out of the 297 hospitals that met the inclusion criteria which had fetal monitor, 82 (27.6%) hospitals calibrated the monitor on time, and 132 hospitals did not perform calibration. The accredited hospitals compared with not accredited hospitals had more performing on time fetal monitor calibration. Compared with not accredited hospitals, the accredited hospitals for 5 services, for 12 services, and for 16 services had 2.2-fold, 2-fold, and 3.4-fold to perform on time fetal monitor calibration respectively.

Conclusion: The accredited hospitals compared with not accredited hospitals had more on time performed fetal monitor calibration. (*Health Science Indones 2013;1:7-10*)

Key words: calibration, fetal monitor, hospital

Calibration of medical equipment including fetal monitor is a crucial issue to ensure the accuracy of the diagnostic results. Therefore, calibration should become a routine tool maintenance procedures performed by health care providers to provide the best care for patients.

Medical equipment including fetal monitor must be regularly and on time calibrated by authorized testing institution health facilities. Calibration is an activity to determine the exact value of the measuring instruments and measured some materials.¹ The device calibration is in accordance with the decree of Ministry of Health.²

Health Facilities Research (Rifaskes) 2011 was one of the national health research conducted by the Research and Development Agency of the Ministry of Health of Indonesia to obtain the latest information about the adequacy and accuracy of supply in institutions implementing health measures, among other, in hospital.³

Calibration was still a problem in most of hospitals in Indonesia. Prior study in Indonesia revealed that out of 442 hospitals, 248 hospitals met the inclusion study criteria, only 25.8% calibrated the slit-lamp on schedule. In addition this prior study noted that the ownership and type of hospitals (teaching/non teaching) were the dominant factors on the risk of not performing on schedule slit- lamp calibration.⁴

The purpose of analysis was to identify the dominant factors related to the implementation of periodic calibration of the fetal monitor in the hospitals.

METHODS

For this analysis we used a part data of Rifaskes cross-sectional study in 2011 among hospitals in Indonesia. The Rifaskes was carried out by the National Institute for Health Research and Development (NHRD) of Indonesia.

Rifaskes study 2011 collected, among others, facility data, human resources (HR), medical equipment, organization and management, existing health services, and output of essential health services, as well as the Essential Quality Indicators. Data were collected through interviews, observation, and assessment of secondary data.

Data collectors were NHRD researchers, health polytechnics (polytechnic), university (college), professional organizations, or other medical research insti-

tutions that meet the required criteria, both at the national and provincial / district/city using a structured questionnaire.⁵

The validation study was carried out by three Schools of Public Health in Indonesia. The validation process carried out 1-2 weeks after the enumerators to collect data. The validity of the data collected has approximately 80%. Therefore it can be concluded that the process of data collection and the data collected was valid.

The hospital class divided into 4 classes (A, B, C, and D). Whereas accreditation status of the hospital consisted of: 0 = no; 1 = accredited for 5 services; 2 = accredited for 12 services; and 3 = accredited for 16 services.⁶

Ownership of public hospitals categorized into Ministry of Health, Provincial Government, District/City Government, military, state, and other Ministry.

Budgeting management pattern consists of central Public Service Agency, regional Public Service Agency and non-Public Service Agency.

Accreditation status can be classified as not accredited or accredited for 5 medical services, 12 medical services, and 16 medical services. Hospitals grade classified into class A, B, C, and D.⁷

Hospital type in medical education categorized into: teaching hospitals that have a memorandum of understanding (MoU), non MoU's teaching hospitals, and non teaching hospitals.

The Rifaskes 2011 study received ethical clearance from the National Ethics Committee of the National Institute for Health Research and Development, Ministry of Health of Indonesia.

Rifaskes 2011 collected data of 685 hospitals from 746 public hospitals in Indonesia.⁸ This due to geographic constraints, security, hospital's refusal to join the study, changing of hospital ownership into private hospital, or hospital start operating after January 2010.

This analysis compared hospitals that have on time calibrated fetal monitor compared with hospitals that did not carry out fetal monitor calibration.

For this analysis we dropped, 34 hospitals which had missing data on calibration, leaving 297 hospitals with complete data.

Out of the 297 hospitals that met the inclusion criteria which had fetal monitor, 26.9% (80/297) hospitals calibrated the monitor on time, and 44.4% (132/297) hospitals did not perform the calibration.

To identify the dominant factors related to fetal monitor on time calibration compared with not doing calibration fetal monitor used relative risk approach.⁸

RESULTS

Table 1 shows that most of the public hospitals (85%) belong to the local governments, and most of them were lower grade (C and D). More than half of public hospitals were accredited, and more than 60% of hospitals were not teaching hospitals.

Furthermore, Table 1 shows that the hospitals which calibrated and did not calibrate fetal monitor were similarly distributed with respect to ownership, budgeting management, and teaching-non teaching hospitals. However, in term of hospital grade, grade B, C, and D hospitals were less likely than grade A hospitals to calibrate fetal monitors.

Table 2, the final model, shows that compared with not accredit hospitals, the accredited hospitals had more performing fetal monitor calibration. Compared with not accredited hospital, the accredited hospital for 5 services, for 12 services, and for 16 services had 2.2-fold, 2-fold, and 3.4-fold to perform on time fetal monitor calibration respectively.

Table 1. Several hospital characteristics and risk on time fetal monitor calibration

| | Yes (n=80) | | Yes (n=80) | | Crude relative risk | 95% confidence interval | P |
|-------------------------------|---------------|------|---------------|-------|---------------------------|-------------------------------|-------|
| Hospital owner | | | | | | | |
| Ministry of health | 2 | 40.0 | 3 | 60.0 | 1.00 | Reference | |
| Provincial government | 8 | 53.3 | 7 | 46.7 | 0.78 | 0.20-3.00 | 0.716 |
| District government | 110 | 66.7 | 55 | 33.3 | 0.56 | 0.17-1.78 | 0.321 |
| Military | 8 | 47.1 | 9 | 52.9 | 0.88 | 0.24-3.26 | 0.851 |
| State | 4 | 44.4 | 5 | 55.6 | 0.93 | 0.22-3.87 | 0.916 |
| Other ministry | 0 | 0 | 1 | 100.0 | 1.67 | 0.17-16.02 | 0.658 |
| Budgeting management | | | | | | | |
| Central public service agency | 5 | 55.6 | 4 | 44.4 | 1.00 | Reference | |
| Local public service agency | 60 | 60.6 | 39 | 39.4 | 0.89 | 0.32-2.48 | 0.818 |
| Non public service agency | 67 | 64.4 | 37 | 35.6 | 0.80 | 0.29-2.25 | 0.672 |
| Hospital grade | | | | | S | | |
| A | 2 | 33.3 | 4 | 66.7 | 1.00 | Reference | |
| B | 27 | 49.1 | 28 | 50.9 | 0.76 | 0.27-2.18 | 0.614 |
| C | 79 | 69.9 | 34 | 30.1 | 0.45 | 0.16-1.27 | 0.132 |
| D | 24 | 63.2 | 14 | 36.8 | 0.55 | 0.18-1.68 | 0.296 |
| Teaching hospital type | | | | | | | |
| MoU teaching hospital | 15 | 48.4 | 16 | 51.6 | 1.00 | Reference | |
| Non MoU teaching hospital | 28 | 59.6 | 19 | 40.4 | 0.78 | 0.40-1.52 | 0.472 |
| Non teaching hospital | 89 | 66.4 | 45 | 33.6 | 0.65 | 0.37-1.15 | 0.140 |

Table 2. Relationship between hospital accreditation status, hospital grade and risk of on time fetal monitor calibration

| | | On time fetal monitor calibration | | | | Adjusted relative risk* | 95% confidence interval | P |
|---------------|----------------------------|-----------------------------------|------|--------|------|-------------------------------|-------------------------------|-------|
| | | No | | Yes | | | | |
| | | (n=132) | | (n=80) | | | | |
| Accreditation | | | | | | | | |
| | Not accredited | 73 | 79,3 | 19 | 20,7 | 1.00 | Reference | |
| | Accredited for 5 services | 30 | 54,5 | 25 | 45,5 | 2.20 | 1.21-4.00 | 0.010 |
| | Accredited for 12 services | 19 | 59,4 | 13 | 40,6 | 1.97 | 0.97-3.98 | 0.060 |
| | Accredited for 16 services | 10 | 30,3 | 23 | 69,7 | 3.37 | 1.84-6.20 | 0.000 |

*Adjusted for hospital grade

DISCUSSION

In interpreting our findings, the readers must be considered limitations of our study. We excluded several participating hospitals with incomplete data.

Hospitals that did not perform fetal monitors calibration were 44.4% (132/297 hospitals). This was not in line with the regulations of the Minister of Health about the maintenance of the hospital, among others, that all devices (including fetal monitors) need to be calibrated on schedule in accordance with the provisions of calibration.⁷ Periodic fetal monitors calibration is generally performed at least 6 months.

Our final model noted that compared with not accredit hospitals, the accredited hospitals had more performing fetal monitor calibration.

Hospital accreditation may increase the fetal monitor calibration. This may be for the purposes of compliance with the accreditation requirement the hospital diagnostic tools need to be calibrated. Therefore the calibration requirements can be used to increase the percentage of hospitals that perform kalibrasi diagnostic tools.

The main factors affecting the calibration execution on schedule most likely were the knowledge and attitude of hospital managers, and in addition to the availability of funds and the existence of institutions implementing the calibration. Hospital's stakeholders need to be constantly aware of the usefulness of calibration (including fetal monitors) as suggested by some experts the following statements.

CONCLUSION

The percentage on schedule fetal monitor calibration was low among hospitals in Indonesia. The accredited hospitals compared with not accredited hospitals had more on time performing fetal monitor calibration.

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REFERENCES

1. Decree of Ministry of Health of the Republic of Indonesia No. 363/Menkes/Per/IV/1998 on equipment testing and calibration in health care facilities.
2. Decree of Ministry of Health of the Republic of Indonesia No. 4 of 2009 on hospital,
3. National Institute for Health Research and Development, Ministry of Health of Indonesia. Health facilities research 2011: Protocol. Jakarta; The Institute: 2011.
4. National Institute for Health Research and Development, Ministry of Health of Indonesia. Health facilities research 2011: Questionnaire. Jakarta; The Institute: 2011.
5. Decree of Ministry of Health of the Republic of Indonesia No. 4 of 2009 on hospital.
6. Regulation of the Minister of Health Republic of Indonesia Number 129/Menkes/Sk/Ii/2008 Hospital on minimum service standards.
7. National Institute for Health Research and Development, Ministry of Health of Indonesia. Rifaskes 011 report.. Jakarta; The Institute: 2011.
8. Barros AJD, Hirakata VN. Alternative for logistic regression in cross-sectional studies: an empirical comparison of models that directly estimates the prevalence ratio. BMC Medical Research Methodology. Oct. 2003; 3 (21) [cited 2010 Dec 10]. Available from <http://www.biomedcentral.com/1471-2288/3/21/>