A scoring system as a tool for antenatal care audit in family medicine

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ABSTRACT

Objective: To propose the antenatal assessment score (AAS) as a tool for auditing the process of antenatal care in family medicine, and to highlight its accessibility by applying it at 2 family health care centers.

Methods: A descriptive study of an audit process was conducted in 2 primary health care centers (non commissioned officers' [NCO] and officers' health centers [OC]) belonging to the Department of Family Medicine, Armed Forces Hospital, Riyadh, Kingdom of Saudi Arabia from February 2001 to June 2002. A systematic random sample of patients registered at the maternal registers of both centers was selected. A score system of 100 points was developed containing items regarding history taking, examination, investigations, treatment, referral, health education, number of visits and record keeping. The information was gathered retrospectively from patients' files at both centers.

Results: The total assessment score approached 67 out of 100 for NCO and 71 out of 100 for OC with a statistically significant difference ($p<0.05$). History taking in general was achieved to 77% in NCO and 86% in OC. Examination whether general (8% and 76%) or obstetric (67% and 72%) was achieved at a lesser level. All investigations were recorded equally in both centers (77%). Referrals, whether routine or emergency, were much less recorded 35-28%. The majority of antenatal records at both centers were partially completed (84.5% and 81%). Indications to any given medications (73% and 91%) and the total number of visits were higher among NCO records with statistically significant difference ($p<0.05$).

Conclusions: Antenatal assessment score is an accessible tool for the audit process of antenatal care in family medicine. In depth analysis and interpretation of the results could be of high importance to total antenatal care. Nationwide use of this audit tool is recommended.

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Antenatal care is widely accepted as one of the functions of primary health care.[1,2] It is linked highly to the preventive care and women's health in general practice, community health care and midwifery. There are many activities that should be conducted within the service including history taking, examination, investigations, prescribing, immunization, health education and referral of high-risk cases. Doctors, midwifes and other health professionals are all involved in the provision of antenatal care. The audit, therefore, is important to evaluate and ensure quality standards of the performed activities. This could be a difficult and lengthy procedure due to the lack of clear standards to compare and due to the complexity of such a service.[3,4] There are several reports written regarding the evaluation of the quality of maternal care by assessing traditional indicators, such as perinatal mortality, and non-traditional outcome measures such as routine antenatal screening.[5-7] But, there are few publications on the methods of general evaluation and audit of the process of antenatal care in primary care.[3-5] In this study, the method of audit of the antenatal care process in

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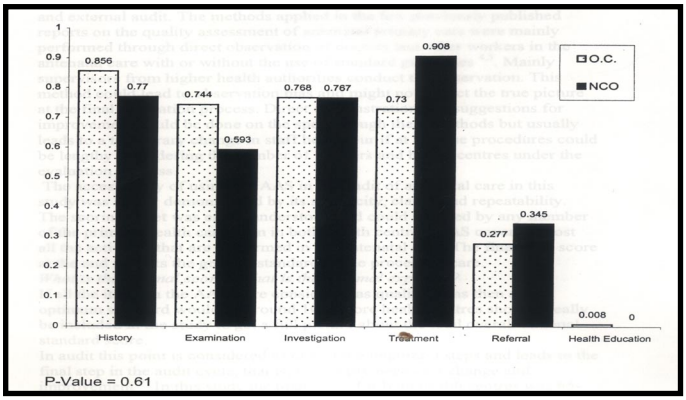

Figure 1 - Health care assessment of patients attending antenatal care at officer's health center and non-comissioned officers clinics, Armed Forces Hospital, Riyadh, Kingdom of Saudi Arabia. NCO - non-commisioned officers, OC - officer's health center.

Table 1 - History taking and physical examination recording at non-commissioned officers (58 cases) and officers clinics (42 cases).

Measures	NCO	OC	P values
Personal history	0.631	0.806	0.962
Gynecological history	0.526	0.630	0.406
Obstetric history	0.929	0.976	0.557
Medical history	0.862	0.952	0.259
Surgical history	0.862	0.944	0.322
Family history	0.862	0.908	0.697
General examination	0.079	0.757	0.103
Obstetric examination	0.679	0.722	0.381

NCO - non-comissioned officers
OC - officer's health center

Table 2 - Antenatal care record keeping at non-commissioned officers and officer's health centers.

Record status	NCO n	NCO (%)	OC n	OC (%)
Complete	0	(0)	1	(2.4)
Partial	49	(84.5)	34	(80.9)
Deficient	9	(15.5)	7	(16.7)
Total	**58**	**(100)**	**42**	**(100)**

P-Value = 0.487, NCO non-commissioned officer's
OC - officer's centers

Table 3 - Number of antenatal visits at non-commissioned officer's and officer's centers health centers.

N of visits	NCO n	NCO (%)	OC n	OC (%)
<3 visits	23	(39.7)	16	(38)
3-5 visits	29	(50)	13	(30)
>5 visits	6	(10.3)	13	(30)
Total	**58**	**(100)**	**42**	**(100)**

P-Value = 0.022, NCO - non-commissioned officer's
OC - officer's centers

family medicine is carried out through the use of a general antenatal assessment score (AAS). The objective of this study is to propose the AAS as a tool for audit and demonstrate its accessibility by applying it on 2 family health care centers.

Methods. This study is a descriptive study of the audit process of antenatal care in family health centers. It was conducted at 2 primary health care centers: the non-commissioned officers'(NCO) health center and the officers' health center (OC) from February 2001 - June 2002. Both centers are attached to the Department of Family and Community Medicine, Armed Forces Hospital, Riyadh, Kingdom of Saudi Arabia. The OC is located at the center of Riyadh and caters for officers and their families inside their residential compound and they are of high to medium social class population. The NCO is located at the end south of the city and caters for lower rank offices and their families who are also classified at lower social class and is also located inside their residential compound. All pregnant women have their follow-up inside the centers' antenatal clinic until their appointment is due at the obstetric clinics of the hospital usually by the 3rd trimester. Each center has a quick access to the hospitals' obstetric unit for emergency and high-risk pregnancies. All investigations were carried inside hospital laboratory or obstetric ultrasound department. Blood and urine specimens were collected at the 2 centers. The policy of antenatal care was formed through co-operation from both Department of Obstetrics and Family and Community Medicine and is periodically reviewed by the antenatal committee. The items of the quality of antenatal care in the AAS were obtained from the standard obstetric flow charts that are used widely at different antenatal care units. The original method of using a checklist of quality items was obtained from Srinivasa and co-workers.[4] This scoring system, AAS, includes items regarding history, physical examinations investigations and comments regarding the management and any given drugs. In addition to these items, health education, referral plans, number of visits and records keeping were added as quality components in the AAS. The total score sums up to 100 and each point score is indicated separately on the AAS sheet. All

these items were given an equal score of one, apart from 2 items. First is the record keeping where 3 indicate the complete record keeping and one for deficient ones. The 2nd was the number of visits, where a score of 3 is given to >5 visits, and a score of one for <3 visits. These 2 items scored higher due to their direct effect on all the other information on antenatal records. The validity of this scoring system was discussed with epidemiologists and research tutors. The research committee of Armed Forces Hospital, Riyadh, KSA approved the study and the scoring system after revision.

A randomized sample of one quarter of all women who attended the antenatal clinic from each health center was selected systematically. All patients were listed at the antenatal register of both centers. Those women who delivered by December 1999 were selected to allow for the complete period of pregnancy to be observed as a whole. Information was obtained from patients' records retrospectively during the study period 2001. The AAS sheet was explained and easily understood by different members of the working team and piloted before the study period.

Using SAS version 6.11 performed analysis of the data. Preliminary examination of the data included descriptive characteristics of the sample. Proportions were analyzed by chi-square test. A probability value of <5% was taken as statistically significant.[8]

Results. The number of selected records from the NCO and OC was 56 and 42 during the study period. The total assessment scores for both health centers were 65.3 and 70.9 out of 100 with a statistically significant difference (P=0.05). **Figure 1** illustrates an overall picture of the total antenatal care activities' recording for example history, examination, investigation, treatment, referral and health education. The bar of treatment indicates if any medications was given, mainly iron, vitamin supplementation and tetanus immunization. The bar of referral similarly indicates whether letters or any indications for emergency referral were stated in the antenatal flow sheets. Health education was achieved very poorly in the 2 centers, with no indications to any form of this activity in both centers. All investigations were recorded equally at both centers. History taking in general was achieved up to 86% of OC and 77% in NCO. **Table 1** shows much detailed description of the history and physical examination recording. Gynecological history and the history of personal information were least recorded in both centers (for example infertility and patient address). Both obstetric and general examination, were achieved in 72% and 76% of OC and in 8% and 68% of NCO with no statistical significance. The majority of both centers' antenatal records were partially complete, and not a single record was fully complete (**Table 2**). The total number of visits showed a significant difference between the 2 centers where it was higher at the NCO (P <0.05) as shown in **Table 3**.

Discussion. Antenatal assessment score is a tool that could be used for self-assessment and for both internal and external audit. The methods applied in the few previously published reports on the quality assessment of antenatal primary care were mainly performed through direct observation of doctors and other workers in the antenatal care with or without the use of standard guidelines.[4,5] Mainly supervisors from higher health authorities conduct the observation. This method could lead to observation bias and might not reflect the true picture at the final evaluation process. Direct demonstration and suggestions for improvement could be carried out on the spot through these methods but usually leads to a temporary change in staff behavior if at all. The procedures could be lengthy considering the number of workers and health centers under the evaluation process. The accessibility of using the AAS in the audit of antenatal care in this study was highly demonstrated by its simplicity, clarity and repeatability. The scoring sheet was easily understood and could be filled by any member of the primary health care team in both health centers. Antenatal assessment score covers almost all the activities that are performed in the antenatal care. The final total score at the end reflects the general standard of the process of care. What is the optimal score? What is the minimal expected? If all the items in the AAS were considered as quality items then an optimum standard would be around 100. More health centers should ideally be included in the study to get a full picture with regards to the total overall national standard score. In audit this point is considered as one of the important steps and leads to the final step in the audit cycle, that is; to identify needs for change and improvement.[9] In this study the total score for both health centers was 65 and 71 out of 100 in NCO and OC in the studied year. A policy could be planned to increase the standard to 90 in the following year and so on.

Looking in depth at the results of the different parts of AAS would indicate to the evaluator which area/areas need further evaluation and improvements. Discussion with the team involved in antenatal care for possible reasons and improvement is necessary to the audit process. For example, the results of this audit showed that examinations, general and obstetrics, were not fully achieved in both centers (76% and 72% at the OC and 8% and 68% of NCO). Both centers follow the same policy, but there were differences between the 2 centers with some points reaching a statistically significant difference.

What were the reasons behind these findings? Poor recording of the findings may be one reason, but the problem arises if the actual procedures were not carried out. Using the antenatal or medical records, as an information source for this tool might be a limitation. Medical record keeping in itself is a quality item that is worth looking at in such a complex health care. Another limitation to this tool, for quality assessment, is that it

answers the question of what is carried out rather than how it is carried out? Audit has 3 main parts to look at; structure, process and outcome.[9] Antenatal assessment score is mainly useful for the audit of the process of care in antenatal care. However, outcome points could be measured indirectly. Limitations to audit, in general, in antenatal care could arise from incomplete or lack of antenatal registry. Sampling might not be carried out properly and this could induce avoidable bias. A sample of 25% of all antenatal records is considered to be sufficient for auditing such service.[9] The small number of health centers that were involved in this study could also be another limitation to its generalisability. Despite the number of limitations discussed, antenatal care in primary health care center remains an important service that requires systematic evaluation. Antenatal assessment score gives a simple guide to the situation in general and could be used for further in depth analyses that might lead to significant improvements of the antenatal care level in primary health care. The application of this tool in different nation wide primary health care centers is recommended.

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