



Research Article

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Evidence based vs traditional journal clubs: Time to switchover

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Abstract

Journal clubs (JC) have been a part of the medical curriculum for long now. Evidence based journal clubs (EJBC) are now being preferred by some. Traditional JCs usually do not provide a satisfactory answer to questions regarding validity, reliability and applicability of the article. EJBC is believed to answer all these questions specifically. However, there is lack of studies comparing traditional with EJBC so this study was carried out to compare the two. **Methodology:** This was a prospective cohort study. Pre and post tests were conducted after each assessed EJBC presentation to test the understanding of the specific topic and improvement in decision making ability. To assess the understanding of study designs and statistical terms, pre and post tests were done at an interval of six months. **Results:** A total of 36 residents were included. Almost all could make their opinion regarding acceptability and applicability of authors' conclusion after the assessed EJBC presentation. The number of correct responses to the test for understanding study design, statistical principles and critical appraisal increased from 27.5% to 68.9% amongst the third year residents. The correct responses after exposure to traditional JC were 27.5% whereas correct responses after about same time of exposure, including six months of EJBC were 59.5%. **Conclusion:** We concluded that as compared with traditional JC, exposure to EJBC resulted in much more improvement in the postgraduates' understanding of study design, statistical principles, critical appraisal skills and decision making capacity.

Keywords: Evidence based medicine, Journal club, Medical education, Decision making skills.

Introduction

Journal club (JC) is a meeting of a group of individuals to discuss current articles with the aim to keep track of the current literature.^{[1],[2]} Started for the first time by "Linzer", it has a long history as an educational process.^[3] A British surgeon late "Sir James Paget" reported the first JC for discussing medical journals.^[4] William Osler established the first formal JC at McGill University in Montreal in 1875 with the aim of purchase and distribution of periodicals, though he knew that similar events were taking place at other places also.^[5]

JC aids in learning understanding of scientific articles and critical appraisal skills. It promotes social contact, provides continuing medical education, encourages debate on and use of research, and aids in keeping in touch with the latest developments.^[6] It also helps medical students and teachers recognize better and more reliable medical literature which are published recently.^{[2],[7]} Over time, JCs have changed parallel to the needs of medical personals and have now been included in curricula of almost all medical fields.^[5] However, the goals have remained the same: to teach critical appraisal of articles, to keep abreast with the current literature and to improve clinical practice.^[3]

Evidence-based medicine (EBM) or evidence-based practice (EBP) aims to combine the best available evidence obtained from the scientific method with clinical expertise and patient values to aid clinical decision making.^[8] With the surge of EBM, some voices in different medical fields all over the world are now favouring replacing traditional JCs with evidence-based JCs.^[9-12] While evaluating an article, evidence-based medicine specifically addresses and answers the

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uestions regarding the validity of the study, clinical utility of the results, and applicability of the results to an individual patient or the local population.^[13] Traditional JCs usually answer the first question by 'maybe' or 'no', and do not provide a satisfactory answer to the second and third questions either. EBJC is believed to answer all these questions specifically. However, there is lack of studies comparing outcomes of traditional JCs with EBJCs.

So, we conducted a study to assess the effect of EBJCs on the residents' understanding of study designs and statistical principles as well as critical appraisal skills and decision making capacity.

Methodology

This prospective cohort study was conducted in the department of medicine, SBKS MI & RC, Sumandeep Vidyapeeth. It was started after getting approval from the institutional ethical committee. The JCs were held once every fifteen days. Participants were all residents of Deptt. of Internal Medicine attending the JC. The topics of the JC were selected on the basis of a problem identified from the wards or on some current advances published. One resident was given the responsibility of forming a PICO question (based on problem/patient, intervention, comparator and outcome) and searching to find the articles with relevant information from different databases. The most relevant article was selected for presentation, while the others were included for discussion. The presentation was done on a PowerPoint with appropriate stress on various parts of the article. The presentation included slides wherever required for explaining various statistical terms to aid understanding of the methodology and results. A critical appraisal of the article was done in the end (with the help of a check list according to the study design) to check validity of the study, reliability of results and applicability to the individual patient and local population. Thus, the JC was planned to impart understanding of basic principles of evidence based medicine i.e; searching with PICO format, assessing the validity in terms of study design, assessing risk of bias, precision of effect, repeatability, reliability and applicability.

To measure the success of EBJC in meeting the objectives, written tests was taken before and after the EBJCs were conducted. It consisted of 10 to 12 questions focused on the primary content of the articles intended to test the understanding and knowledge of the research question before and after the presentation of each JC session. Similarly, a test was conducted to assess the knowledge of the statistical terms and ability of understanding results before the start of the study and then after six months. The questions prepared were validated and the same questions were included in both the Pre and Post-tests. To compare the traditional JC with EBJCs, pre test responses of third year residents were compared with their post test responses, pretest responses of third year residents were compared with post test responses of second year residents and pretest responses of second year residents were compared with post test responses of first year residents.

Statistical Analysis: Pre and post test responses were compared for difference in the number of correct answers.

Results

Total 36 residents were included in the study, 12 from each year. Total eight JCs were presented during the six months period. In three out of these eight, pre and post tests were carried out for assessing knowledge about the topic. In the first JC assessed, the study presented had reported a new indication of a drug and weighed its effects with adverse effects. In the pretest, 66.66% were not sure if they agreed with the author's conclusion or not. 75% were not sure if the indication applied to their own settings. Post test, 67% could make a decision that the drug can be used for the new indication, 83.33% agreed with the author's conclusion. However, none of them agreed that the drug can be used for the new indication in their own setting. Thus, at the end of the presentation they could decide confidently if the author's conclusion was acceptable and whether it could be applied on their own patients.

The second JC again presented a study addressing use of a drug in patients with heart failure (presently, not recommended). In pretest, 80% preferred to use the comparator drug in heart failure. 60% were not sure if the author's conclusion was acceptable and 66% were not sure about applying the conclusion in their own setting. In post test, all of them were confident that the author's conclusion was acceptable and were sure that the drug can be used in their setting also.

The third assessed JC included an article about a new contraindication of a commonly used and effective drug. The authors had presented a significant incidence of the adverse effect of the drug which caused anxiety and policy changes as well as decline in the use of this drug. In the pretest, 57.3 % were not sure if the drug caused the adverse effect in question, 53% could not make up their mind about the acceptability of the results, 54% thought that the policy change was justified. In posttest, almost 97% made up their mind about the significance of the contraindication and could point out the specific scenarios where the drug should be avoided. None of them answered in favour of the policy change in the posttest thus again clearing the dilemma.

The assessment of understanding of the basics of scientific article - study design and statistical terms was done at the end of six months. Pre-test responses of the third year residents were compared to their post test responses to assess the effect of EBJC in long term. (Table 1) To compare traditional JC with EBJC, second year post test responses were compared to third year pretest responses (Table 2) and the second year pretest responses were compared to first year post test responses. (Table 3)

Before the pretest, third year residents were exposed to traditional JCs. In the posttest after six months of exposure to EBJC, correct responses to questions regarding statistical terms like p-value and CI, understanding of a forest plot and interpretation of the results increased from 28.91% to 83.3%. (Table 1) However, the correct responses to questions regarding study design and quality of study showed improvement by 33.75% (26% vs 59.75%).

Table1. Third year residents' pre and post test responses

S. No	Question	Correct responses in Pretest	Correct responses in Post test
1	Regarding assessing validity of study	16.5%	75%
2	Regarding publication bias	25%	75%
3	Regarding understanding p-value	66%	83.3%
4	Regarding study design in which forest plot is presented	33%	91.6%
5	Understanding components of forest plot	25%	91.6%
6	Understanding confidence interval	16.5%	83.3%
7	Characteristics of a good quality study	46%	58%
8	Regarding correct sequence of levels of evidences	8%	48%
9	Regarding reliability of an article	16.5%	75%
10	Characteristics of an RCT	25%	58%

Before the pretest, third year residents were exposed to traditional JCs, whereas at the time of posttest, second year residents were exposed to JCs for about the same time but out of this time six months were with EBJC. Hence, the responses of these two were compared. There were 70.21% correct responses of second year residents in the post test to questions

regarding statistical terms like p value and CI, understanding of forest plot and interpretation of results as compared to 28.91% correct responses in third year residents' pretest.(Table 2) However, correct responses to the questions regarding study design and quality of study were 26% vs 49.37%.

Table 2: Third year residents' pretest responses vs second year residents' post test responses

S. No	Question	Correct responses in third year pretest	Correct responses in second year posttest
1	Regarding assessing validity of study	16.5%	75%
2	Regarding publication bias	25%	43%
3	Regarding understanding p-value	66%	85%
4	Regarding study design in which forest plot is presented	33%	86%
5	Understanding components of forest plot	25%	90%
6	Understanding confidence interval	16.5%	58%
7	Characteristics of a good quality study	46%	50%
8	Regarding correct sequence of levels of evidences	8%	43%
9	Regarding reliability of an article	16.5%	33%
10	Characteristics of an RCT	25%	61.5%

Before the pretest, third year residents were exposed to traditional JCs, whereas at the time of posttest, second year residents were exposed to JCs for about the same time but out of this time six months were with EBJC. Hence responses of these two were compared. There were 22.58% correct responses of second year residents in the post test to questions

regarding statistical terms like p value and CI, understanding of a forest plot and interpretation of results as compared to 46.91% correct responses in third year residents' pretest. (Table 3) However, correct responses to the questions regarding study design and quality of study were 19.37% vs 36.5%.

Table3: Second year residents' post test responses vs first year residents' pretest responses

S. No	Question	Correct responses in second year pretest	Correct responses in first year posttest
1	Regarding assessing validity of study	25%	33%
2	Regarding publication bias	28%	33%
3	Regarding understanding p-value	33%	53%
4	Regarding study design in which forest plot is presented	28%	63%
5	Understanding components of forest plot	8%	58%
6	Understanding confidence interval	25%	41.5%
7	Characteristics of a good quality study	16.5%	25 %
8	Regarding correct sequence of levels of evidences	25%	63 %
9	Regarding reliability of an article	16.5%	33%
10	Characteristics of an RCT	8%	25%

Discussion

In traditional JC participants discuss recent medical articles to either accept or reject the author's results and conclusions. The differentiating points of EBJCs as conducted by us were: identifying the question from real scenarios and difficulties in managing the patients in wards, searching the databases for all available relevant articles, presenting the authors' conclusions and their perspective on the study results including explanations for inconsistent or unexpected results. Apart from these a very important part of EBJC was systematically critically appraising the article for validity, reliability and applicability and in the end making one's own conclusion based on the local circumstances and patients' values and preferences with plans to expand on their significance later. The conclusion thus made were sometimes not the same as the author's conclusion depending on the population where it would be applied. Another important component was explaining the statistical terms used in the article separately and individually so imparting a better understanding of the results, minimizing the chances of misinterpretation.

There were instances when no conclusion could be made based on one article or a need was felt to analyse more studies addressing the same question (especially when the article presented was not a systematic review) or comparing the therapy in question with therapies other than that considered in the particular article presented. In such cases, the next session of JC was kept for analyzing other studies in the context of results and questions raised from the first session. Another resident or a group of residents was given the task of searching for all the relevant articles available to answer the questions raised. The relevant and valid studies were included in the next discussion and efforts were made to arrive at a conclusion based on the evidence available. We also kept a record of the conclusion made at the end and plan to make evidence based protocols for efficient management of commonly confronted conditions locally.

We carried out this study to identify the difference that EBJC makes to the postgraduates' capacities as compared to the traditional JCs. Our Pre-test assessed the needs, the presentation and discussion offered improvement in ability to understand and apply scientific articles while Post-test confirmed the worth of EBJC.^[14]

There have been many studies done in the past to assess the outcome of various modalities of teaching on critical appraisal skills and decision making capacity. A study reported that self proclaimed competence had no correlation with actual competence in these skills.^[15] There is little evidence available favouring positive impact on performance after didactic Continuing Medical Education.^{[14],[16]} Another study reported 33-42% correct responses on assessing the critical appraisal skills of resident physicians exposed to traditional JCs and.^[7] We compared traditional JC with EBJCs by comparing pre test responses by the third year residents with their post test responses, pretest responses by the third year residents with post test responses by second year residents and pretest responses by second year residents with post test responses by

first year residents (to match the time of traditional JC exposure and EBJC exposure to the nearest possible). This therefore gave a proper assessment of the residents' abilities with critical concepts of study design, statistical terms and critical appraisal, as they evolved over time with EBJC presentations.

After EBJCs, correct responses increased from 28.91% in pretest to 83.3% in post test amongst the third year residents. The average correct responses after exposure to traditional JC were 21.77% whereas correct responses after about same time of exposure of JC, including six months of EBJC were 57.68%. The improvement was seen in all aspects. However, it was less marked with respect to the questions concerned with the quality of studies, and study design.

All students agreed that EBJCs improved their critical thinking and reading habits over and above that by traditional JCs.

Conclusion

There was a marked improvement in understanding of statistical terms, ability to make correct inferences from results, critical appraisal skills and decision making capacity of residents after exposure to the EBJC as compared to the correct responses after traditional JC presentation. Almost all residents felt that EBJC gave them a better understanding of the published articles and all agreed that it aided immensely in decision making.

Conflicts of interest: No conflict of interest noted.

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