

THE REVIEW ARTICLE and its IMPORTANCE IN CANCER RESEARCH: DO WE NEED IT OR NOT?

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ABSTRACT

Worldwide, cancer rates could further increase to 15 million new cases in the year 2020. Cancer may affect people of all ages, but the risk increases with age. It is known that the life expectancy is going up and that the number of old people is higher today than 20-30 years ago. There are three ways of fighting cancer: To Prevent, to Cure and to Care (the three letters: PCC). Many patients are still of working age, when they get the disease. We should cure these patients, we must help them to get better and be able to work again. This is the task and the goal of the cancer research. Researchers have worked very intensively in the last decade, the scientific fields are flooded with information every day; The exponential increase of original scientific articles in cancer research makes it difficult for the reader (scientist) to keep up to date. Review articles summarize the current state of research on a specified topic and contain valuable data leading to new suggestions and new ideas. Cancer research needs critical and good review publications as a basis for the planning of further projects and for a well-directed and a well-structured research in the future. The importance and significance of the review articles will be discussed from the viewpoint of the patient, the clinician, the industry and the research foundations as leading partners in cancer research.

Key words: cancer research, opinion, research foundations, review article.

Cancer research identifies causes of this disease and develops strategies to prevent and to treat it. The researchers ask questions and work on different projects to answer their questions. Then the results of the studies are evaluated, summarized and published to inform other researchers working on the same topic about the latest results. Research articles have an important significance, however this significance is limited. The research articles do not give basic summaries and an overall view about a topic and the findings related to the topic.

Review articles do not report original research data, they summarize the current state of the research on a specified and a particular topic, playing an integrative role. All findings and/or discoveries are sorted and evaluated according to their high quality and relevance to the subject. The reference list makes it possible for a reader to quickly find an adequate publication for a special question.

Research can be compared with a “jigsaw puzzle”. Each completed study, each research article is like a small piece of this puzzle. For further projects it is necessary and important to summarise the research findings from time to time in a review article. A review article is like a puzzle picture. When the puzzle pieces are put together for a picture, you can see where pieces are missing. These missing pieces are unsolved questions, significant gaps in the research topic.

The exponential increase of original scientific articles in cancer research makes it difficult for the reader (scientist) to keep up to date.

Fig 1. presents the number of all research articles about four cancer diseases from 1994 up to 2008: Multiple myeloma, lymphoma, lung- and colorectal cancer (1). The incidence of the morbidity world wide is 3-6/100 000 population for multiple myeloma, 4-17/100 000 for lymphoma, 30-120/100 000 for lung cancer and 3-48/100 000 for colorectal cancer (2, 3). The numbers of the research articles in the four topics show the same course, increasing slightly between 1994 and 2003, with an enormous rise in years 2004 and 2006. It is absolutely clear that nobody can possibly keep up to date with this quantity of information. Nobody can read and evaluate many and many thousand of research articles. Table 1. presents the

percentage of all review articles. From 1994 to 2008 the percentage of the review articles lay in range of 8-24 % (mean: 16 %) for multiple myeloma , 8-19% (mean: 14%) for lymphoma, 7-18 % (mean: 13%) for lung cancer and 7-18% (mean: 14%) for colorectal cancer, except for the year 2005 (37-49%). This means that the number of the review articles increase and alter parallel to those of research articles. The fact that the number of the research articles and the number of the review articles show the **same course in all four topics** is unexpected and not explicable at present time.

The review articles can be divided in three groups: Mini-reviews are articles up to 7 pages, midi-reviews contain 8-11 pages, large or full reviews 12- over 15 pages. Table 2 presents the number of all review articles in 1995, 2000, 2007 and 2008 for lung cancer and multiple myeloma. In every case mini-review articles are most numerous. These reviews are the basis for large review articles: The mini-review articles form a small-puzzle-picture, which presents a new puzzle piece in a large picture. You can see that the number of the large review articles is very low. For example there were 581 large review articles about lung cancer and 78 about multiple myeloma in 2008. That is only **1.8 %** and **1.5 %** of the research articles. In 2007 this percentage was **0.15 %** for lung cancer and **2.5 %** for multiple myeloma.

Partners in cancer research

Table 3 shows that cancer research has four leading partners: The patient, the industry, the clinician and research foundations. All these partners have different position in cancer research.

Patient as a partner in cancer research

The goal of each study is to help tumor patients and to develop new and effective drugs against tumor diseases. Patients have an important position in cancer research. They and/or their family members financially support the different research projects of the cancer leagues, associations, foundations, societies etc. Each person has a right to learn about the use its financial support. The patients

have a right to obtain information about the therapies, the development of new drugs and the state of the current research. How can the patients understand the results of a research study/project? They cannot! The patients are non-specialists, they are not interested in how many research studies were carried out. The patients are interested in learning more about the content and the significance of the studies. When the results of several research articles are summarized in a review article, a scientific journalist can evaluate and summarize the findings in an informative paper for the general public.

Industry as a partner in cancer research

Industry is a profit organization. However the chemical industry is well informed about the different research projects, a good review article is a gold mine for the pharmaceutical companies. In a good review article the findings of a specific topic are evaluated, selected and analyzed with conclusions and new ideas. All these factors are helpful in the development of novel and potential drugs, or of a combination of drugs used already in cancer treatment.

Clinician as a partner in cancer research

Clinician treats patients with drugs developed by pharmaceutical companies. The clinician evaluates the effects and side-effects of the drugs. This information is very useful for the development of new drugs. For the optimal application of these drugs the clinician should also have theoretical knowledge. What is the best way to obtain this information? The doctors have no time to read a lot of research articles and they do not always have enough experience to understand the results of research articles. Therefore review articles are the best way for the clinicians.

Research foundations as partners in cancer research

Cancer Research foundations, leagues, associations and societies as non-profit organizations play a very important role and carry responsibility in cancer research. They are coordinators between patients and researcher and have a good connection to clinicians and industry. Fundraising events are organized to support cancer research, sponsors are asked. Special research programs are provided for the

scientist. The submitted cancer research projects are evaluated by advisory boards or by scientific committees. The questions arise: Which criteria are decisive for accepting a research project? Is there a relationship between the subject area of the various research projects? The task of the cancer research foundations is to plan and connect the different research projects and to steer the research along a direct and promising path. For decisions about special defined topics, for the evaluation of the submitted projects it is essential to have a summary of the previous research findings in an overview article. Therefore research foundations should include review articles in their research programs, they should call for writing and completion of review articles. And if it is necessary, the foundation should cooperate with the industry. Review articles belong definitely to the research program.

The values of review-articles in cancer research: The review article presents the current state of science on a specific topic, therefore it has a significant place in the planning of further research projects. Review articles have the same value as research projects. The funding should recognize the value of review articles.

Where do you publish a review article? The best way is an Open access journal. The advantage of the Open access journal: The paper will be peer-reviewed and published very fast. The complete article can be read by many potential readers and can obtain more citations. Open access articles are in the interests of the international research community.

The review article as indicator in cancer research. Cancer rates could further increase to 15 million new cases in the year 2020 worldwide (4). According to the American Cancer Society 7.6 million people died from the cancer in the world during 2007 (5). The word “Cancer” is still feared and scares patients. Everybody hopes for the “big breakthroughs”. Researchers have worked very intensively in the last decade, the scientific fields are flooded with information every day. Cancer research looks more and more like a wood. How do we go for a walk in a wood? We look for the best and direct route, we look for a signpost, for an information

board. Without orientation, without signpost we could run round and round or come to a dead end. Do we want to do the same in cancer research? No, we do not. Cancer research needs critical and good review publications, they are the signpost and the information board for us. Cancer research also needs coordinators in the field of review articles. Without review articles which summarize the scientific information about a specified field, many valuable data could get lost. Valuable data, which could lead to a fundamental change and to the long-expected “big breakthroughs” in cancer research. Review articles catch these valuable data leading to new suggestions and new ideas. A well-directed, a well-structured cancer research has a priority in the near future. Such research “style” could help to save the costs of cancer. The American Cancer Society (6) reported that the costs of cancer in 2007 were USD 219.2 billion.

I asked in the title: Do we need review articles in cancer research? Yes we do. Review articles are extremely important in cancer research. The patients need them, the clinicians need them and the industry needs them: WE NEED THEM.

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