

# Systemic Immune-Inflammation Index and Mortality in Testicular Cancer: A Systematic Review and Meta-Analysis

**Table S1.** PRISMA Checklist.

Section and Topic	Item #	Checklist item	Location where item is reported
<b>TITLE</b>			
Title	1	Identify the report as a systematic review.	Page 1
<b>ABSTRACT</b>			
Abstract	2	See the PRISMA 2020 for Abstracts checklist.	Page 1
<b>INTRODUCTION</b>			
Rationale	3	Describe the rationale for the review in the context of existing knowledge.	Paragraph 4 and 5 of the introduction section
Objectives	4	Provide an explicit statement of the objective(s) or question(s) the review addresses.	Paragraph 5 of the introduction section
<b>METHODS</b>			
Eligibility criteria	5	Specify the inclusion and exclusion criteria for the review and how studies were grouped for the syntheses.	Subheading 2.4
Information sources	6	Specify all databases, registers, websites, organisations, reference lists and other sources searched or consulted to identify studies. Specify the date when each source was last searched or consulted.	Subheading 2.3
Search strategy	7	Present the full search strategies for all databases, registers and websites, including any filters and limits used.	Subheading 2.3 and Supplementary Appendix 1
Selection process	8	Specify the methods used to decide whether a study met the inclusion criteria of the review, including how many reviewers screened each record and each report retrieved, whether they worked independently, and if applicable, details of automation tools used in the process.	Subheading 2.4
Data collection process	9	Specify the methods used to collect data from reports, including how many reviewers collected data from each report, whether they worked independently, any processes for obtaining or confirming data from study investigators, and if applicable, details of automation tools used in the process.	Subheading 2.4

Section and Topic	Item #	Checklist item	Location where item is reported
Data items	10a	List and define all outcomes for which data were sought. Specify whether all results that were compatible with each outcome domain in each study were sought (e.g. for all measures, time points, analyses), and if not, the methods used to decide which results to collect.	Subheading 2.6
	10b	List and define all other variables for which data were sought (e.g. participant and intervention characteristics, funding sources). Describe any assumptions made about any missing or unclear information.	Subheading 2.6
Study risk of bias assessment	11	Specify the methods used to assess risk of bias in the included studies, including details of the tool(s) used, how many reviewers assessed each study and whether they worked independently, and if applicable, details of automation tools used in the process.	Subheadings 2.5
Effect measures	12	Specify for each outcome the effect measure(s) (e.g. risk ratio, mean difference) used in the synthesis or presentation of results.	Subheading 2.6
Synthesis methods	13a	Describe the processes used to decide which studies were eligible for each synthesis (e.g. tabulating the study intervention characteristics and comparing against the planned groups for each synthesis (item #5)).	Subheading 2.6
	13b	Describe any methods required to prepare the data for presentation or synthesis, such as handling of missing summary statistics, or data conversions.	Subheading 2.6
	13c	Describe any methods used to tabulate or visually display results of individual studies and syntheses.	Subheading 2.6
	13d	Describe any methods used to synthesize results and provide a rationale for the choice(s). If meta-analysis was performed, describe the model(s), method(s) to identify the presence and extent of statistical heterogeneity, and software package(s) used.	Subheading 2.6
	13e	Describe any methods used to explore possible causes of heterogeneity among study results (e.g. subgroup analysis, meta-regression).	Subheading 2.6
	13f	Describe any sensitivity analyses conducted to assess robustness of the synthesized results.	Subheading 2.6
Reporting bias assessment	14	Describe any methods used to assess risk of bias due to missing results in a synthesis (arising from reporting biases).	Subheading 2.6
Certainty assessment	15	Describe any methods used to assess certainty (or confidence) in the body of evidence for an outcome.	Subheading 2.6
<b>RESULTS</b>			
Study selection	16a	Describe the results of the search and selection process, from the number of records identified in the search to the number of studies included in the review, ideally using a flow diagram.	Subheading 3.1

Section and Topic	Item #	Checklist item	Location where item is reported
	16b	Cite studies that might appear to meet the inclusion criteria, but which were excluded, and explain why they were excluded.	Subheading 3.1
Study characteristics	17	Cite each included study and present its characteristics.	Subheading 3.2
Risk of bias in studies	18	Present assessments of risk of bias for each included study.	Subheadings 3.2
Results of individual studies	19	For all outcomes, present, for each study: (a) summary statistics for each group (where appropriate) and (b) an effect estimate and its precision (e.g. confidence/credible interval), ideally using structured tables or plots.	Subheadings 3.3 and 3.4
Results of syntheses	20a	For each synthesis, briefly summarise the characteristics and risk of bias among contributing studies.	Subheadings 3.3 and 3.4
	20b	Present results of all statistical syntheses conducted. If meta-analysis was done, present for each the summary estimate and its precision (e.g. confidence/credible interval) and measures of statistical heterogeneity. If comparing groups, describe the direction of the effect.	Subheadings 3.3 and 3.4
	20c	Present results of all investigations of possible causes of heterogeneity among study results.	Subheadings 3.3 and 3.4
	20d	Present results of all sensitivity analyses conducted to assess the robustness of the synthesized results.	Subheadings 3.3 and 3.4
Reporting biases	21	Present assessments of risk of bias due to missing results (arising from reporting biases) for each synthesis assessed.	Subheadings 3.3 and 3.4
Certainty of evidence	22	Present assessments of certainty (or confidence) in the body of evidence for each outcome assessed.	Subheadings 3.3 and 3.4
<b>DISCUSSION</b>			
Discussion	23a	Provide a general interpretation of the results in the context of other evidence.	Paragraph 2 of the Discussion section
	23b	Discuss any limitations of the evidence included in the review.	Paragraph 8 of the Discussion section
	23c	Discuss any limitations of the review processes used.	Paragraph 8 of the Discussion section
	23d	Discuss implications of the results for practice, policy, and future research.	Paragraph 8 of the Discussion section

Section and Topic	Item #	Checklist item	Location where item is reported
<b>OTHER INFORMATION</b>			
Registration and protocol	24a	Provide registration information for the review, including register name and registration number, or state that the review was not registered.	Subheading 2.2
	24b	Indicate where the review protocol can be accessed, or state that a protocol was not prepared.	Subheading 2.2
	24c	Describe and explain any amendments to information provided at registration or in the protocol.	Subheading 2.2
Support	25	Describe sources of financial or non-financial support for the review, and the role of the funders or sponsors in the review.	Page 9
Competing interests	26	Declare any competing interests of review authors.	Page 9
Availability of data, code and other materials	27	Report which of the following are publicly available and where they can be found: template data collection forms; data extracted from included studies; data used for all analyses; analytic code; any other materials used in the review.	Page 9

**Table S2.** Inclusion and exclusion criteria of included studies.

<i>Author</i>	<i>Inclusion and exclusion criteria</i>
Emre Y et .al	Patients were divided into the testicular tumor group (group 1) and the control group (group 2). Group 1 consisted of patients with testicular cancer, while group 2 was composed of patients without testicular tumors who presented to the hospital with different complaints, such as varicocele and hydrocele, during the same period.
Frankhauser CD et.al	“We included patients who underwent first-line chemotherapy for metastatic GCT at our institution between 2000 and 2015. We excluded patients with extragonadal GCT, bilateral testicular GCT, missing systemic inflammatory markers or missing follow-up information.”

Yoshinaga Y et. al	“We included Patients who were newly diagnosed with a germ cell tumor and received first-line chemotherapy in our institution between February 2007 and December 2018. Patients who underwent radical orchiectomy only were excluded”.
Chovanec M et. al	“We included patients with GCTs treated from 1999 to 2015 in the National Cancer Institute in Slovakia, with available complete blood count before systemic platinum-based chemotherapy and sufficient follow-up clinical data.”

**Table S3.** Outcome definitions of included studies.

<i>Author</i>	<i>Outcome</i>	<i>Definition</i>
Emre Y et .al	Overall Survival	NR
Frankhauser CD et.al	Overall Survival	From the date of initial chemotherapy to the date of death from any cause.
Yoshinaga Y et. al	Overall Survival	NR
	Progression free-survival	NR
Chovanec M et. al	Overall Survival	The date of diagnosis to the date of death or last follow-up
	Progression free-survival	The date of orchiectomy or tumour biopsy to the date of progression or death or the date of the last adequate follow-up
NR : Not Reported		

**Table S4.** NEWCASTLE - OTTAWA QUALITY ASSESSMENT SCALE FOR INCLUDED STUDIES.

<b>NEWCASTLE - OTTAWA QUALITY ASSESSMENT SCALE FOR COHORT STUDIES</b>										
<i>STUDY</i>	<i>SELECTION</i>			<i>COMPARABILITY</i>	<i>OUTCOME</i>			<i>SCORE</i>	<i>Evidence quality</i>	
	Representativeness of the exposed cohort	Selection of the non-exposed cohort	Ascertainment of exposure	Demonstration that outcome of interest was not present at start of study	Comparability of Cohorts on the Basis of the Design or Analysis	Assessment of outcome	Was follow-up long enough for outcomes to occur	Adequacy of follow up of cohorts		
Emre Y et .al	☆	☆	☆	☆		☆		☆	6	High risk of bias
Frankhauser CD et.al	☆	☆	☆	☆		☆	☆	☆	7	Low Risk of bias
Yoshinaga Y et. al	☆	☆	☆	☆	☆☆	☆	☆	☆	9	Low Risk of bias
Chovanec M(Cohort A) et. al		☆	☆	☆	☆	☆	☆	☆	7	Low Risk of bias

Chovanec M (Cohort B) et. al	☆	☆	☆	☆	☆	☆	☆	7	Low Risk of bias
---------------------------------	---	---	---	---	---	---	---	---	------------------------

Table S5. Search Strategy.

## Pubmed

**Testicular neoplasm (#1)**

Testicular Neoplasms [MH] OR Testicular Neoplasm [MH] OR Neoplasm, Testicular [MH] OR Testicular Tumors [MH] OR Neoplasms, Testis [MH] OR Neoplasm, Testis [MH] OR Testis Neoplasm [MH] OR Testis Neoplasms [MH] OR Testicular Tumor [MH] OR Tumor, Testicular [MH] OR Tumors, Testicular [MH] OR Neoplasms, Testicular [MH] OR Tumor of Rete Testis [MH] OR Rete Testis Tumor [MH] OR Rete Testis Tumors [MH] OR Testis Tumor, Rete [MH] OR Testis Tumors, Rete [MH] OR Cancer of Testis [MH] OR Testis Cancer [MH] OR Cancer, Testis [MH] OR Cancers, Testis [MH] OR Testis Cancers [MH] OR Cancer of the Testes [MH] OR Cancer of the Testis [MH] OR Testicular Cancer [MH] OR Cancer, Testicular [MH] OR Cancers, Testicular [MH] OR Testicular Cancers [MH] OR “Testicular Neoplasms” [TIAB] OR “Testicular Neoplasm” [TIAB] OR “Testicular Tumors” [TIAB] OR “Testis Neoplasm” [TIAB] OR “Testis Neoplasms” [TIAB] OR “Testicular Tumor” [TIAB] OR “Tumor of Rete Testis” [TIAB] OR “Rete Testis Tumor” [TIAB] OR “Rete Testis Tumors” [TIAB] OR “Cancer of Testis” [TIAB] OR “Testis Cancer” [TIAB] OR “Testis Cancers” [TIAB] OR “Cancer of the Testes” [TIAB] OR “Cancer of the Testis” [TIAB] OR “Testicular Cancer” [TIAB] OR “Testicular Cancers” [TIAB] OR “Testicular Neoplasms” [OT] OR “Testicular Neoplasm” [OT] OR “Testicular Tumors” [OT] OR “Testis Neoplasm” [OT] OR “Testis Neoplasms” [OT] OR “Testicular Tumor” [OT] OR “Tumor of Rete Testis” [OT] OR “Rete Testis Tumor” [OT] OR “Rete Testis Tumors” [OT] OR “Cancer of Testis” [OT] OR “Testis Cancer” [OT] OR “Testis Cancers” [OT] OR “Cancer of the Testes” [OT] OR “Cancer of the Testis” [OT] OR “Testicular Cancer” [OT] OR “Testicular Cancers” [OT]

**Systemic immune inflammation index (#2)**

“Systemic immune inflammation index” [TIAB] OR “Systemic immune-inflammation index” [TIAB] OR “SII” [TIAB] OR “Systemic immune inflammation index” [OT] OR “Systemic immune-inflammation index” [OT] OR “SII” [OT]

**Formula**

#1 AND #2

## Web of Science

**Testicular neoplasm (#1)**

ALL=(“Testicular Neoplasms” OR “Testicular Neoplasm” OR “Neoplasm, Testicular” OR

<p>“Testicular Tumors” OR “Neoplasms, Testis” OR “Neoplasm, Testis” OR “Testis Neoplasm” OR “Testis Neoplasms” OR “Testicular Tumor” OR “Tumor, Testicular” OR “Tumors, Testicular” OR “Neoplasms, Testicular” OR “Tumor of Rete Testis” OR “Rete Testis Tumor” OR “Rete Testis Tumors” OR “Testis Tumor, Rete” OR “Testis Tumors, Rete” OR “Cancer of Testis” OR “Testis Cancer” OR “Cancer, Testis” OR “Cancers, Testis” OR “Testis Cancers” OR “Cancer of the Testes” OR “Cancer of the Testis” OR “Testicular Cancer” OR “Cancer, Testicular” OR “Cancers, Testicular” OR “Testicular Cancers” OR “Testicular Neoplasms” OR “Testicular Neoplasm” OR “Testicular Tumors” OR “Testis Neoplasm” OR “Testis Neoplasms” OR “Testicular Tumor” OR “Tumor of Rete Testis” OR “Rete Testis Tumor” OR “Rete Testis Tumors” OR “Cancer of Testis” OR “Testis Cancer” OR “Testis Cancers” OR “Cancer of the Testes” OR “Cancer of the Testis” OR “Testicular Cancer” OR “Testicular Cancers” OR “Testicular Neoplasms” OR “Testicular Neoplasm” OR “Testicular Tumors” OR “Testis Neoplasm” OR “Testis Neoplasms” OR “Testicular Tumor”)</p>
<p><b>Systemic immune inflammation index (#2)</b>  ALL=(“Systemic immune inflammation index” OR “Systemic immune-inflammation index” OR “SII” OR “Systemic immune inflammation index” OR “Systemic immune-inflammation index” OR “SII”)</p>
<p><b>Formula</b>  #1 AND #2</p>

### Scopus

<p><b>Testicular neoplasm (#1)</b>  ALL ( "testicular neoplasms" OR "testicular neoplasm" OR "neoplasm, testicular" OR "testicular tumors" OR "neoplasms, testis" OR "neoplasm, testis" OR "testis neoplasm" OR "testis neoplasms" OR "testicular tumor" OR "tumor, testicular" OR "tumors, testicular" OR "neoplasms, testicular" OR "tumor of rete testis" OR "rete testis tumor" OR "rete testis tumors" OR "testis tumor, rete" OR "testis tumors, rete" OR "cancer of testis" OR "testis cancer" OR "cancer, testis" OR "cancers, testis" OR "testis cancers" OR "cancer of the testes" OR "cancer of the testis" OR "testicular cancer" OR "cancer, testicular" OR "cancers, testicular" OR "testicular cancers" OR "testicular neoplasms" OR "testicular neoplasm" OR "testicular tumors" OR "testis neoplasm" OR "testis neoplasms" OR "testicular tumor" OR "tumor of rete testis" OR "rete testis tumor" OR "rete testis tumors" OR "cancer of testis" OR "testis cancer" OR "testis cancers" OR "cancer of the testes" OR "cancer of the testis" OR "testicular cancer" OR "testicular cancers" OR "testicular neoplasms" OR "testicular neoplasm" OR "testicular tumors" OR "testis neoplasm" OR "testis neoplasms" OR "testicular tumor" OR "tumor of rete testis" OR "rete testis tumor" OR "rete testis tumors" OR "cancer of testis" OR "testis cancer" OR "testis cancers" OR "cancer of the testes" OR "cancer of the testis" OR "testicular cancer" OR "testicular cancers" )</p>
--

**Systemic immune inflammation index (#2)**

ALL ( "systemic immune inflammation index" OR "systemic immune-inflammation index" OR "sii" OR "systemic immune inflammation index" OR "systemic immune-inflammation index" OR "sii" )

**Formula**

#1 AND #2

**Cochrane Library****Testicular neoplasm AND Systemic immune inflammation index**

“Testicular Neoplasms” OR “Testicular Neoplasm” OR “Neoplasm, Testicular” OR “Testicular Tumors” OR “Neoplasms, Testis” OR “Neoplasm, Testis” OR “Testis Neoplasm” OR “Testis Neoplasms” OR “Testicular Tumor” OR “Tumor, Testicular” OR “Tumors, Testicular” OR “Neoplasms, Testicular” OR “Tumor of Rete Testis” OR “Rete Testis Tumor” OR “Rete Testis Tumors” OR “Testis Tumor, Rete” OR “Testis Tumors, Rete” OR “Cancer of Testis” OR “Testis Cancer” OR “Cancer, Testis” OR “Cancers, Testis” OR “Testis Cancers” OR “Cancer of the Testes” OR “Cancer of the Testis” OR “Testicular Cancer” OR “Cancer, Testicular” OR “Cancers, Testicular” OR “Testicular Cancers” OR “Testicular Neoplasms” OR “Testicular Neoplasm” OR “Testicular Tumors” OR “Testis Neoplasm” OR “Testis Neoplasms” OR “Testicular Tumor” OR “Tumor of Rete Testis” OR “Rete Testis Tumor” OR “Rete Testis Tumors” OR “Cancer of Testis” OR “Testis Cancer” OR “Testis Cancers” OR “Cancer of the Testes” OR “Cancer of the Testis” OR “Testicular Cancer” OR “Testicular Cancers” OR “Testicular Neoplasms” OR “Testicular Neoplasm” OR “Testicular Tumors” OR “Testis Neoplasm” OR “Testis Neoplasms” OR “Testicular Tumor” OR “Tumor of Rete Testis” OR “Rete Testis Tumor” OR “Rete Testis Tumors” OR “Cancer of Testis” OR “Testis Cancer” OR “Testis Cancers” OR “Cancer of the Testes” OR “Cancer of the Testis” OR “Testicular Cancer” OR “Testicular Cancers” in All Text AND “Systemic immune inflammation index” OR “Systemic immune-inflammation index” OR “SII” OR “Systemic immune inflammation index” OR “Systemic immune-inflammation index” OR “SII” in All Text - (Word variations have been searched)

**Embase****Testicular neoplasm AND Systemic immune inflammation index**

('neoplasm, testicular':ti,ab,kw OR 'neoplasms, testis':ti,ab,kw OR 'neoplasm, testis':ti,ab,kw OR 'tumor, testicular':ti,ab,kw OR 'tumors, testicular':ti,ab,kw OR 'neoplasms, testicular':ti,ab,kw OR 'testis tumor, rete':ti,ab,kw OR 'testis tumors, rete':ti,ab,kw OR 'cancer, testis':ti,ab,kw OR 'cancers, testis':ti,ab,kw OR 'cancer,



testicular':ti,ab,kw OR 'cancers, testicular':ti,ab,kw OR 'testicular neoplasms':ti,ab,kw OR 'testicular neoplasm':ti,ab,kw OR 'testicular tumors':ti,ab,kw OR 'testis neoplasm':ti,ab,kw OR 'testis neoplasms':ti,ab,kw OR 'testicular tumor':ti,ab,kw OR 'tumor of rete testis':ti,ab,kw OR 'rete testis tumor':ti,ab,kw OR 'rete testis tumors':ti,ab,kw OR 'cancer of testis':ti,ab,kw OR 'testis cancer':ti,ab,kw OR 'testis cancers':ti,ab,kw OR 'cancer of the testes':ti,ab,kw OR 'cancer of the testis':ti,ab,kw OR 'testicular cancer':ti,ab,kw OR 'testicular cancers':ti,ab,kw) AND ('systemic immune inflammation index':ti,ab,kw OR 'systemic immune-inflammation index':ti,ab,kw OR 'sii':ti,ab,kw)