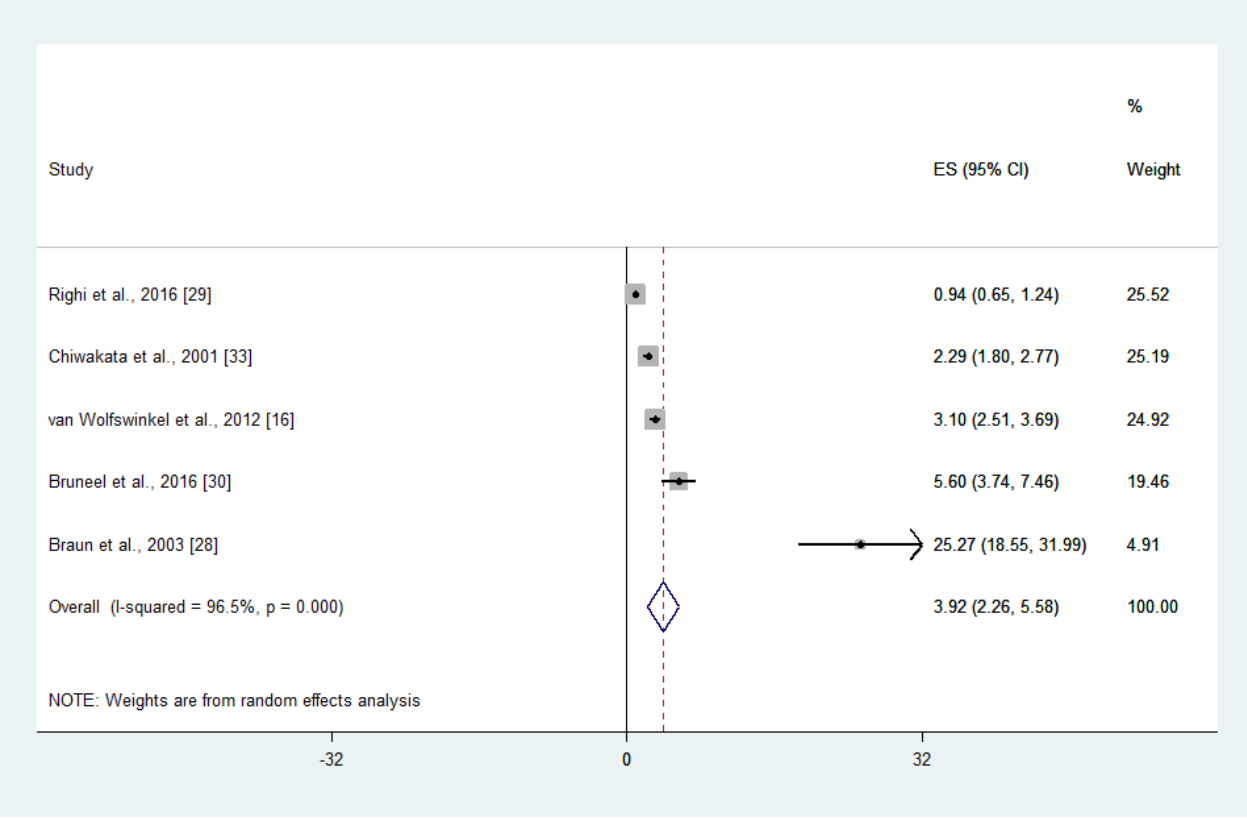
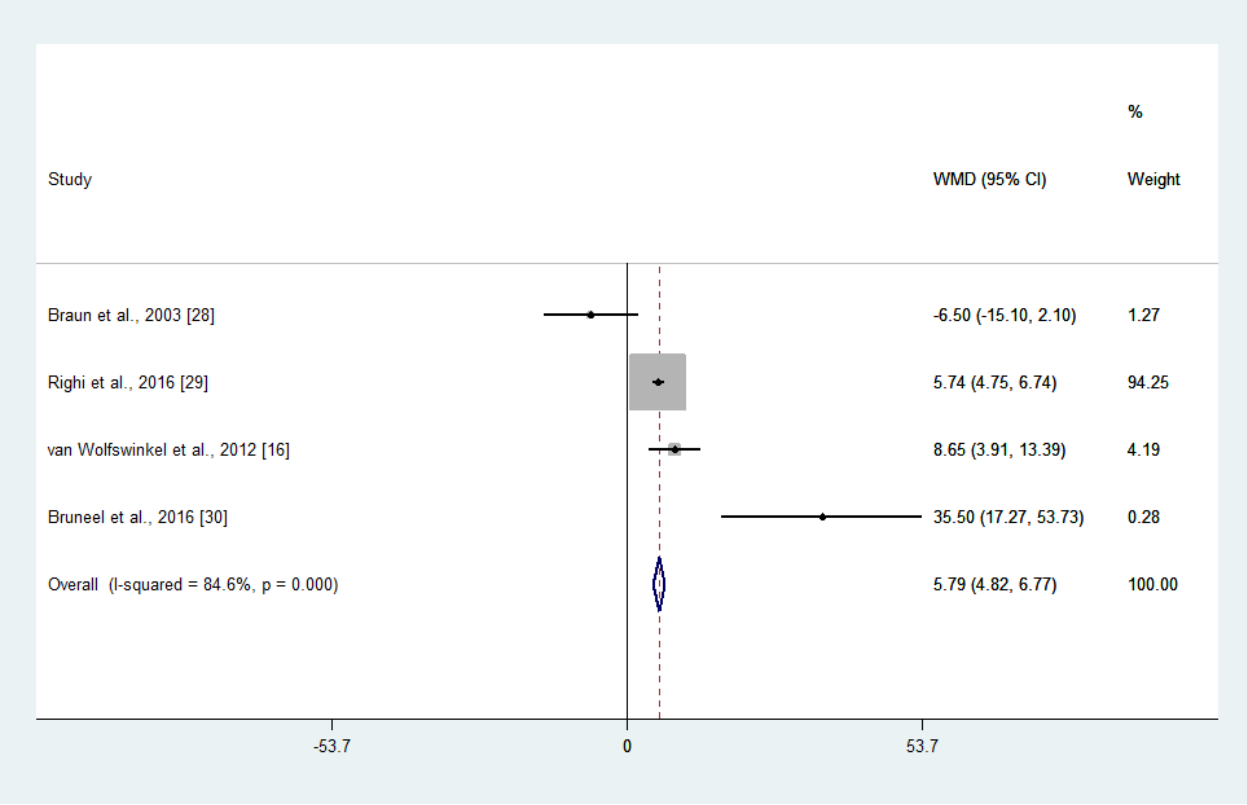
Supplementary data

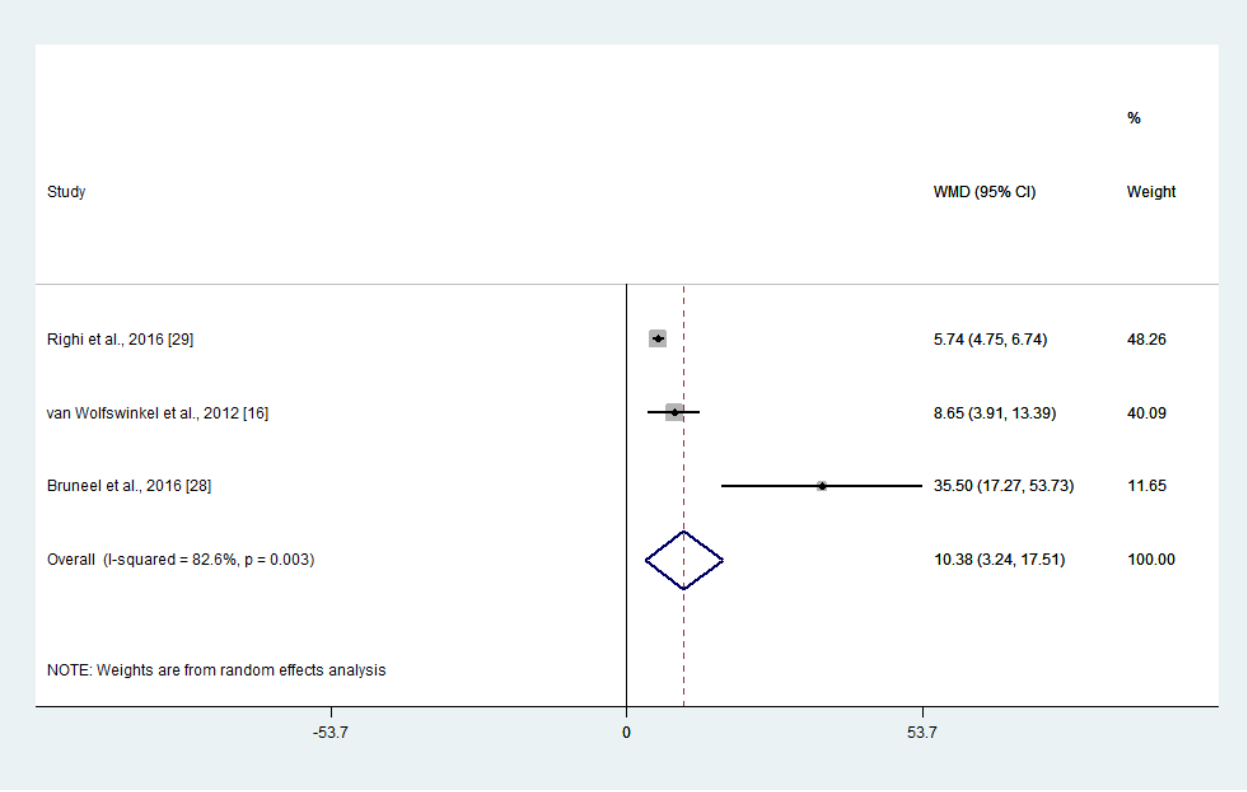
Supplementary figures



Supplementary Figure S1. Forrest plot demonstrated the pooled mean PCT levels in patients with uncomplicated malaria. **Abbreviation**: ES, effect estimate (pooled mean PCT); CI, confidence interval. **Explanation of the forest plot**: black diamond symbol, point estimate; dashed line: pooled mean PCT levels; I^2, level of heterogeneity; p = 0.00 or less than 0.05, significant heterogeneity.



Supplementary Figure S2. Forrest plot demonstrated the difference in the mean PCT levels (ng/mL) between patients with severe malaria and uncomplicated malaria by the fixed-effect model. **Abbreviation**: WMD, weighted mean difference; CI, confidence interval. **Explanation of the forest plot**: black diamond symbol, point estimate; dashed line: WMD of PCT levels; I^2, level of heterogeneity; p = 0.00 or less than 0.05, significant heterogeneity.



Supplementary Figure S3. Forrest plot demonstrated the difference in the mean PCT levels (ng/mL) between patients with severe malaria and uncomplicated malaria (sensitivity analysis). **Abbreviation**: WMD, weighted mean difference; CI, confidence interval. **Explanation of the forest plot**: black diamond symbol, point estimate; dashed line: WMD of PCT levels; I^2, level of heterogeneity; p = 0.00 or less than 0.05, significant heterogeneity.

Supplementary tables

Table S1. Search terms

Databases	**Search terms/Search strategy**	**Date**
MEDLINE (via PubMed)	(malaria OR Plasmodium) AND (Procalcitonin OR PCT) Search results: 169	1 to 8 December 2021
Scopus	(malaria OR Plasmodium) AND (Procalcitonin OR PCT) Search option: Title, abstract, keywords Search results: 191	1 to 8 December 2021
Web of Science	(malaria OR Plasmodium) AND (Procalcitonin OR PCT) Search option: All fields Search results: 129	1 to 8 December 2021

Table S2. Quality of the included studies

No.	Authors	Eligibility criteria	Study subjects and the setting	Exposure measured in a valid and reliable way 'gold standard'	A specified diagnosis or definition	Confounding factors	Dealing with confounding factors	Outcomes measured in a valid and reliable way	Appropriate statistical analysis	Scores (8)	Risk of bias (low, moderate, high)
1	Braun et al., 2003	Yes	Yes	Yes	Yes	Yes	NA	Yes	Yes	8	Low
2	Bruneel et al., 2016	Yes	Yes	Yes	Yes	Yes	NA	Yes	Yes	8	Low
3	Chiwakata et al., 2001	Yes	Yes	Yes	Yes	Yes	NA	Yes	Yes	8	Low
4	Erdman et al., 2011	Yes	Yes	Yes	Yes	Yes	NA	Yes	Yes	8	Low
5	Hesselink et al., 2009	Yes	Yes	Yes	Yes	Yes	NA	Yes	Yes	8	Low
6	Hollenstein et al., 1998	Yes	Yes	Yes	Yes	Yes	NA	Yes	Yes	8	Low
7	Huang et al., 2019	Yes	Yes	Yes	Yes	Yes	NA	Yes	Yes	8	Low

8	Lin et al., 2018	Yes	Yes	Yes	Yes	Yes	NA	Yes	Yes	8	Low
9	Lubell et al., 2015	Yes	No	Yes	Yes	Yes	NA	Yes	Yes	7	Moderate
10	Mbengue et al., 2011	Yes	Yes	Yes	Yes	Yes	NA	Yes	Yes	8	Low
11	Mohapatra et al., 2013	Yes	Yes	Yes	Yes	Yes	NA	Yes	Yes	8	Low
12	Prodjosoewojo et al., 2019	Yes	No	Yes	Yes	Yes	NA	Yes	Yes	7	Moderate
13	Righi et al., 2016	Yes	Yes	Yes	Yes	Yes	NA	Yes	Yes	8	Low
14	Uzzan et al., 2006	Yes	Yes	Yes	Yes	Yes	NA	Yes	Yes	8	Low
15	van Wolfswinkel et al., 2012	Yes	Yes	Yes	Yes	Yes	NA	Yes	Yes	8	Low

Supplementary files for review

PRISMA 2020 Abstract Checklist

Section and Topic	Item #	Checklist item	Reported (Yes/No)
TITLE			
Title	1	Identify the report as a systematic review.	Yes
BACKGROUND			
Objectives	2	Provide an explicit statement of the main objective(s) or question(s) the review addresses.	Yes
METHODS			
Eligibility criteria	3	Specify the inclusion and exclusion criteria for the review.	Yes
Information sources	4	Specify the information sources (e.g. databases, registers) used to identify studies and the date when each was last searched.	Yes
Risk of bias	5	Specify the methods used to assess risk of bias in the included studies.	Yes
Synthesis of results	6	Specify the methods used to present and synthesise results.	Yes
RESULTS			
Included studies	7	Give the total number of included studies and participants and summarise relevant characteristics of studies.	Yes
Synthesis of results	8	Present results for main outcomes, preferably indicating the number of included studies and participants for each. If meta-analysis was done, report the summary estimate and confidence/credible interval. If comparing groups, indicate the direction of the effect (i.e. which group is favoured).	Yes
DISCUSSION			
Limitations of evidence	9	Provide a brief summary of the limitations of the evidence included in the review (e.g. study risk of bias, inconsistency and imprecision).	Yes
Interpretation	10	Provide a general interpretation of the results and important implications.	Yes
OTHER			
Funding	11	Specify the primary source of funding for the review.	In the main

Section and Topic	Item #	Checklist item	Reported (Yes/No)
			manuscript file
Registration	12	Provide the register name and registration number.	Yes

PRISMA 2020 Checklist

Section and Topic	Item #	Checklist item	Location where item is reported
TITLE			
Title	1	Identify the report as a systematic review.	Page 1
ABSTRACT			
Abstract	2	See the PRISMA 2020 for Abstracts checklist.	Page 1-2
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of existing knowledge.	Page 2
Objectives	4	Provide an explicit statement of the objective(s) or question(s) the review addresses.	Page 2
METHODS			
Eligibility criteria	5	Specify the inclusion and exclusion criteria for the review and how studies were grouped for the syntheses.	Page 2
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.	Page 2
Search strategy	7	Present the full search strategies for all databases, registers and websites, including any filters and limits used.	Page 2
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.	Page 3
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.	Page 3
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.	Page 3
	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.	Page 3
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.	Page 3

Section and Topic	Item #	Checklist item	Location where item is reported
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.	Page 3
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)).	Page 3
	13b	Describe any methods required to prepare the data for presentation or synthesis, such as handling of missing summary statistics, or data conversions.	Page 3
	13c	Describe any methods used to tabulate or visually display results of individual studies and syntheses.	Page 3
	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.	Page 3
	13e	Describe any methods used to explore possible causes of heterogeneity among study results (e.g. subgroup analysis, meta-regression).	Page 3
	13f	Describe any sensitivity analyses conducted to assess robustness of the synthesized results.	Page 3
Reporting bias assessment	14	Describe any methods used to assess risk of bias due to missing results in a synthesis (arising from reporting biases).	Page 3
Certainty assessment	15	Describe any methods used to assess certainty (or confidence) in the body of evidence for an outcome.	Page 3
RESULTS			
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.	Page 3-4
	16b	Cite studies that might appear to meet the inclusion criteria, but which were excluded, and explain why they were excluded.	Page 3-4
Study characteristics	17	Cite each included study and present its characteristics.	Page 6-7
Risk of bias in studies	18	Present assessments of risk of bias for each included study.	Page 8
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.	Page 8-10
Results of syntheses	20a	For each synthesis, briefly summarise the characteristics and risk of bias among contributing studies.	Page 8-10
	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.	Page 8-10
	20c	Present results of all investigations of possible causes of heterogeneity among study results.	Page 8-10
	20d	Present results of all sensitivity analyses conducted to assess the robustness of the synthesized results.	Page 8-10
Reporting biases	21	Present assessments of risk of bias due to missing results (arising from reporting biases) for each synthesis assessed.	Page 10
Certainty of evidence	22	Present assessments of certainty (or confidence) in the body of evidence for each outcome assessed.	Page 10

Section and Topic	Item #	Checklist item	Location where item is reported
DISCUSSION			
Discussion	23a	Provide a general interpretation of the results in the context of other evidence.	Page 10-12
	23b	Discuss any limitations of the evidence included in the review.	Page 12
	23c	Discuss any limitations of the review processes used.	Page 12
	23d	Discuss implications of the results for practice, policy, and future research.	Page 12
OTHER INFORMATION			
Registration and protocol	24a	Provide registration information for the review, including register name and registration number, or state that the review was not registered.	Page 2
	24b	Indicate where the review protocol can be accessed, or state that a protocol was not prepared.	Page 2
	24c	Describe and explain any amendments to information provided at registration or in the protocol.	Page 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 13
Competing interests	26	Declare any competing interests of review authors.	Page 13
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 13